

WORK PLAN PROPOSAL

for Eight
Underground
Storage
Tank
Sites

ISLETA BLVD. SW
CORRIDOR

BRIDGE BLVD. SW
TO
PAJARITO RD. SW

ALBUQUERQUE,
BERNALILLO
COUNTY, NM

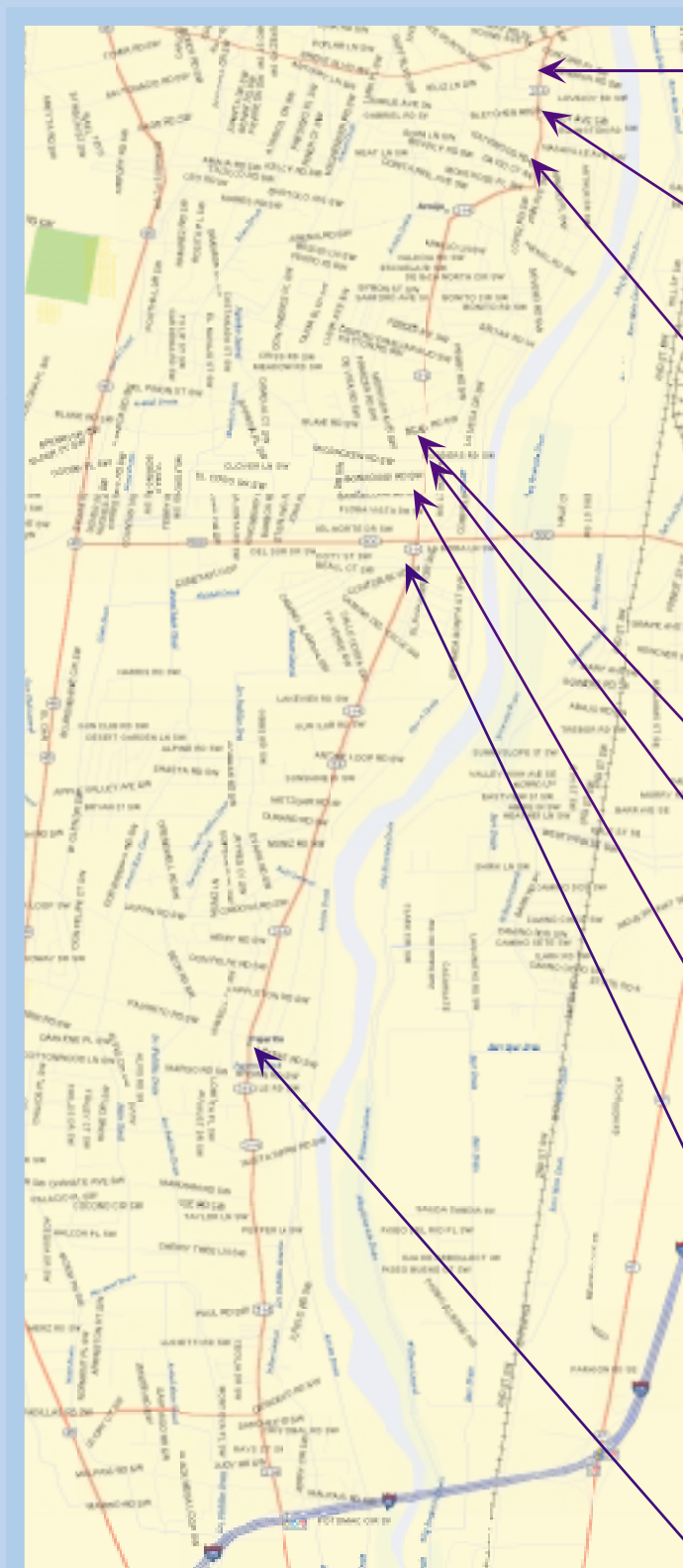
December 8, 1999

Prepared For:
Bernalillo County Environmental
Health Department
600 Second St. NW, Suite 500
Albuquerque, NM 87102

Prepared By:

FEI | FAITH ENGINEERING, INC.

TECUMSEH
PROFESSIONAL ASSOCIATES, INC.



The Pit Stop
305 Isleta SW



Old Horn
430 Isleta SW



Phil's Auto
701 Isleta SW



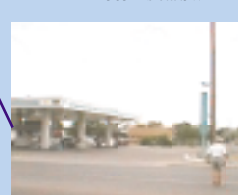
Rodger's Drilling
2615 Isleta SW



Climate Roofing
2700 Isleta SW



Lee & Blakely
3031 Isleta SW



ATEX #213
3501 Isleta SW



G&S Community Corner
6100 Isleta SW

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December 8, 1999

Mr. David Nelson
Environmental Health Scientist
Bernalillo County Environmental Health Department
600 Second St. – Suite 500
Albuquerque, NM 87102

RE: Eight-Site Work Plan – Isleta Corridor
Contract No. 980473

Dear David:

Pursuant to your request, please find included herewith two (2) copies of Faith Engineering, Inc.'s (FEI) Eight-Site Work Plan for the UST Sites on Isleta Boulevard SW. FEI has entered into a new subcontract agreement with Tecumseh Professional Associates (TPA) in order to maintain our teaming arrangement with Mr. Bill Brown (formerly of Leedshill Herkenhoff, Inc.). These eight sites have been investigated and in most cases have had active remediation systems installed. The time that has elapsed since these sites were investigated and had their respective remediation systems turned off (generally since 1996) will necessitate their re-investigation in order to assess the options for continued site cleanup. The need to re-assess these sites is the subject of these work plans.

With the exception of the Pit Stop (305 Isleta) and Lee and Blakely Feed Store (3031 Isleta), the other six sites have relied on soil vacuum extraction (SVE) or air sparge/vacuum extraction (AS/VE) remediation systems in the past with varying degrees of success. An optional task that has been proposed on five of the sites includes pilot testing of high flow SVE or AS/VE wells in order to evaluate this as a remedial alternative. It was brought to our attention yesterday that the NMED/USTB might be adopting a new policy of not approving SVE or AS/VE systems for the South Valley sites. This is due to the shallow ground water (which limits the vacuum that can be applied without concomitant increases in ground water production) and the silty/clayey nature of many of the soils in the South Valley (which limits vapor flow through these low permeability soils). As an alternative, the NMED/USTB is suggesting that source removal (dig and haul) may be more suitable for South Valley sites.

Although FEI does not disagree with NMED/USTB's new policy and has seen ample evidence of the limitations of SVE and AS/VE in this type of hydrogeologic environment, we also believe that these systems can be made more effective with proper design and operation. Additionally, the use of source removal as a remedial alternative is limited because at many sites, soil and ground water contamination extends under roadways, buildings, and utility right-of ways which, in turn, limits its effectiveness unless the roadway, buildings and utilities are also removed.

Mr. David Nelson
Page 2 of 2
December 9, 1999

This apparent dilemma suggests that another variant on the source removal scenario could be implemented during roadway and utility upgrades. That is, a plan in which source removal occurs during or slightly ahead of roadway construction could be implemented with appropriate coordination with the Bernalillo County Public Works Department. Such a scenario also suggests the necessity of some building condemnation and demolition, which may or may not be required under the present roadway/utility upgrade plans for the Isleta Corridor. In many of these situations, it may be appropriate to consider removal of only a portion of the contaminated material that could be exposed without building demolition so that roadway and utility construction could be made through clean backfill.

Another consideration, in the context of these work plans, would be to substitute the preparation of a source removal reclamation plan for the proposed optional SVE or AS/VE pilot testing. Such a reclamation plan would consider the feasibility of source excavation (percent contaminant removal, existing buildings, utilities, roadways, estimated contaminated soil disposal/backfill quantities and costs). FEI would reserve the right to modify the costs for such an optional reclamation plan preparation in-lieu of the pilot testing tasks proposed herein.

Obviously, this issue will need additional consideration and discussion with appropriate personnel at NMED/USTB and Bernalillo County prior to final decisions regarding these eight sites and others along the Isleta Corridor. We appreciate your patience in our preparation of these work plans. Bill Brown and I have devoted considerable time to evaluating these sites which has included: the review of old NMED/USTB case files, inspecting and mapping the sites, and evaluating previous monitoring and remediation system effectiveness.

Please be advised that proposed scope of work and budget for Task One of all 8 Work Plans, *Site Review and Work Plan Development*, has been approved by the NMED/USTB under a separate submittal. Budget details for all other tasks are included in each of the enclosed work plans. Please do not hesitate to contact the undersigned if you have any questions or comments.

Respectfully submitted,
FAITH ENGINEERING, INC.

Stuart Faith, P.E.
Certified Scientist No. 80

Enclosures

cc: Ms. Joyce Castro-Shearer - NMED/USTB

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1.0 INTRODUCTION

Faith Engineering, Inc. and Tecumseh Professional Associates, Inc. (FEI/TPA) have teamed together to prepare eight Site Work Plans for the Bernalillo County Environmental Health Department (BCEHD). These Work Plans will provide for the continued investigation of eight leaking underground storage tank (LUST) sites along the Isleta Boulevard Corridor south of Bridge Boulevard in Albuquerque's South Valley area. The intent of these Work Plans is to provide updated information regarding contaminant extent and assessing the remediation needs of each site.

Bernalillo County's goal is to upgrade the Isleta Corridor roadway and utility infrastructure. Approximately 28 – 30 LUST sites have been identified along this section of the Isleta Corridor, all of which have the potential to impact right-of-way improvements. To prepare for this upgrade, the County has elected to take the lead in investigating selected sites to determine the extent of subsurface contamination in accordance with the New Mexico Environment Department's (NMED) Underground Storage Tank Regulations (USTR), which are administered by the NMED, Underground Storage Tank Bureau (NMED/USTB). The investigations into onsite and offsite contaminant extent and performance of Hydrogeologic Investigations, as currently required under USTR §1210, and subsequent reclamation planning is the objective of this series of Work Plans

The NMED/USTB is now implementing Risk Based Corrective Action (RBCA), and some of the sites along the Isleta Corridor will be left in their current condition in order to allow natural attenuation to eventually degrade the residual contamination under the present NMED/USTB Corrective Action reimbursement policy. Bernalillo County will thus be faced with the prospect of dealing with the soil and ground water contaminants during roadway and utility upgrades under the RBCA based reimbursement program of the NMED/USTB. By coordinating the roadway upgrade planning and construction with the investigative and remedial planning necessary for the Isleta Corridor improvements, a more efficient and less delayed project will result.

BCEHD has requested that FEI/TPA prepare Work Plans for eight of these sites, which include the following:

- The Pit Stop Site, 305 Isleta SW, NMED Facility #24299001
- The Old Horn Site (now Ruli's Service), 430 Isleta SW, NMED Facility #301002
- Phil's Auto Site, 701 Isleta SW, NMED Facility #5517001
- Rodgers Drilling Site, 2615 Isleta SW, NMED Facility #11017001
- The Climate Roofing Site, 2700 Isleta SW, NMED Facility #3245001
- Lee & Blakely Site (now Brown's Discount Feedstore), 3031 Isleta SW, NMED Facility #11475001
- ATEX #213 Site (now Gasman), 3501 Isleta SW, NMED Facility #18774007
- The Former G&S Community Corner Site (now Kollar Kar Kare), 6100 Isleta SW, NMED Facility #6647001

These sites have been selected by BCEHD for additional investigation and remediation to meet the Isleta Corridor objectives described above. Other sites within the Isleta Corridor are currently being evaluated under the purview of NMED/USTB through their State Lead or Responsible Party (RP) corrective action programs.

In preparing these work plans, FEI/TPA have done extensive review of previous investigation and reclamation reports on file with the NMED/USTB. Additional efforts have included site inspections, detailed site mapping, evaluation of prior remediation system effectiveness, and discussion with previous contractors. Two sites (The Pit Stop and Lee & Blakely) have recently been characterized by FEI with Leedshill Herkenhoff, Inc. as subcontractor. For these two sites, proposed efforts in this work plan are directed toward additional ground water monitoring and reporting and, in the case of The Pit Stop, have been recommended for Air Sparge/Vacuum Extraction (AS/VE) pilot testing (see discussion below). Due to the length of time that has elapsed since the other six sites have been characterized and sampled, FEI/TPA has proposed additional drilling, soil sampling, ground water sampling, and VE or AS/VE testing as described below.

The following provides a brief general description of the various activities that will be provided by FEI/TPA in the accomplishment of the eight Work Plans.

1. Review existing NMED/USTB information from each site and any of the adjacent properties, as needed, regarding previously conducted subsurface investigations.
2. Sample existing ground water monitoring wells.
3. Complete and sample soil borings, complete and sample additional 2" diameter monitor wells, complete 4" diameter vacuum extraction (VE) wells, and 1" diameter vacuum test (observation) wells at sites where pilot AS/VE testing is warranted (see item 4 below).
4. At some sites, FEI/TPA recommends, as an option, the implementation of a short-term AS/VE pilot test to evaluate the AS/VE remedial alternative, the effects of subsurface vapor flow short-circuiting, well spacing, zone(s) of influence, shallow ground water generation vs. applied vacuum, flow, and off-gas emission concentration and composition. Data collected during the pilot test will be used to aid in the subsequent design of an AS/VE reclamation system. The AS/VE pilot tests are presented as an optional follow-on to the Hydrogeologic Investigations at the sites where this type of reclamation system was either previously used (Rodger's, Atex 213 and G&S Community Corner) or where they might be a suitable reclamation alternative (Pit Stop and Old Horn).
5. A Site Investigation Report for each site will be prepared and will include information from the On-Site Investigation, as required in USTR §1206 B, and the Hydrogeologic Investigation, as required by USTR §1210 C. The results of the initial ground water sampling, sampling of the new wells, soils data, and results of the pilot testing (where applicable) will be included in this report.

6. Three additional quarters of ground water sampling, monitoring and reporting will be conducted on an abbreviated sampling (fewer wells) for a more limited hydrocarbon testing (EPA Method 8021 instead of the initial EPA Method 8260 analyses).

These work plans contain no provisions for the sampling of private or public water supplies. Although shallow ground water impacts are one of the largest risks to ground water use in the South Valley, the time required for implementing an effective neighborhood well inventory and sampling program are considered to be beyond the scope of work required herein. Those sites where NMED/USTB case file records indicate that private well(s) were historically impacted have been indicated in the site history section of each work plan. BCEHD and NMED should consider a general approach to locating ground water receptors in the Isleta Corridor for later RBCA planning and implementation. These work plans are targeted specifically at assessing site contaminant extent and remedial action alternatives. Should BCEHD or NMED/USTB desire, specifically identified residential wells can be added to this plan for sampling with minor cost adjustments.

For consistency purposes, the following eight Work Plans have been prepared using the same format, but are intended to be separate, stand-alone documents. The first section of each Plan provides an introduction and history of each site. The second section provides information on existing site conditions, and the third section provides recommended actions (Scope of Work). Site figures follow each narrative, which are followed by the proposed budget Cost Detail Forms. The following Table 1 provides a summary of each site's proposed investigation and sampling needs.

TABLE 1
SUMMARY OF INVESTIGATION
AND MONITORING FOR
THE EIGHT ISLETA CORRIDOR UST SITES

Facility Information			Hydrogeologic Investigation						Soil	GW Monitoring	
SITE NAME	USTB FACILITY NUMBER	ADDRESS	Soil Borings	2" Monitor Wells	4" Vacuum Test Wells	1" Vacuum Observation Well Nests	Vacuum Extraction Tests	AS/VE Tests	Soil Analysis for EPA 8015 & 8021	Initial MWs for Analysis EPA 8260	3 Qtrrs. GW Samp./Analysis EPA 8021
The Pit Stop	24299001	305 Isleta Blvd. SW	N/A	N/A	2	4	2	1	N/A	7	21
Old Horn	301002	430 Isleta Blvd. SW	20	7	2	6	2	1	54	14	30
Phil's Auto	5517001	701 Isleta Blvd. SW	11	5	N/A	N/A	N/A	N/A	32	13	34
Rodger's Drilling	11017001	2615 Isleta Blvd. SW	17	2	8	5	3	1	50	29	39
Climate Roofing	3245001	2700 Isleta Blvd. SW	10	3	N/A	N/A	N/A	N/A	26	13	30
Lee & Blakely Feed	11475001	3031 Isleta Blvd. SW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8	24
Atex 213	18774007	3501 Isleta Blvd. SW	13	12	3	4	3	1	50	30	35
G&S Community Center	6647001	6100 Isleta Blvd. SW	5	4	5	3	7	N/A	28	22	30

2.0 THE PIT STOP SITE - 305 ISLETA BOULEVARD SW

NMED Facility Number 24299001

2.1 INTRODUCTION/SITE HISTORY

Based on a comprehensive review of available historical data, past Site knowledge, and completion of a detailed site inspection, FEI/TPA completed the following Site summary. In addition, detailed maps were constructed summarizing known site conditions and are presented as Figures 2A and 2B.

- This Site was initially investigated by the Bernalillo County Environmental Health Department (BCEHD) during the early phases of their Technology Deployment Initiative (TDI). Tanks were first identified at the Site after a combined magnetometer and ground penetrating radar survey was conducted for BCEHD by Sage Earth Sciences. In their report, "RGS Surveys, Suspect Tank Sites, Isleta Blvd – Albuquerque, NM" dated September, 1997, Sage Earth Sciences identified at least one suspect UST at the site.

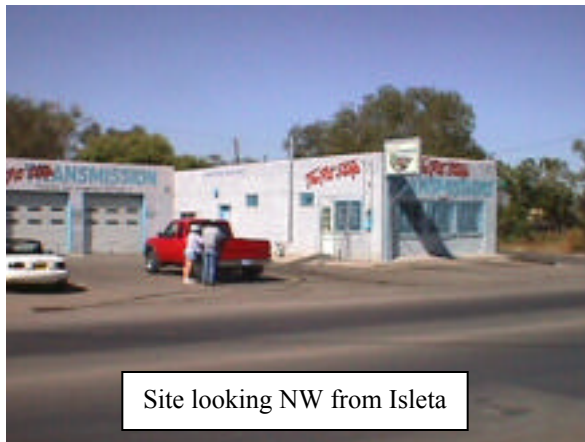


- On April 1 and 2, 1998, three USTs were removed from the ground. During UST removal activities, one 1,000-gallon gasoline tank and two 750-gallon tanks were found, which are believed to have been leaded gasoline tanks. A fourth tank, a 2000-gallon suspected oil tank, was also found. It was pumped out and closed in place by filling it with concrete. Soil and ground water samples were collected in the excavation pits and generally showed elevated TPH concentrations (11,000 mg/kg) adjacent to the oil tank and lower TPH concentrations (100 to 240 mg/kg) beneath the other tanks which were removed.
- During the tank excavation activities, approximately 250 gallons of a product/ground water mix were removed from the tank excavations and disposed of off-site. No other remedial activities have been conducted at the site.
- Subsequent investigation by FEI has shown that soil and ground water contamination is still present at the site and will require additional active remediation. Figures 2A and 2B provide soil and ground water contaminant extent at the Site. Additional details regarding these recent investigations are available in the *Site Investigation Report, The Pit Stop, 305 Isleta Blvd. SW*, FEI, September, 1999.

- During FEI's Investigation, a total of 12 soil borings and 7 monitor wells were advanced at the Site to depths of between 8 and 20 feet below ground surface (bgs) at the locations shown on Figures 2A and 2B. Hollow-stem auger (HSA) drilling techniques were used. Site lithology, as observed in retrieved split-spoon samples and soil cuttings, can generally be classified as near surface (< 3 to 4 ft. bgs) silts and silty sands which grade with depth to fine-to-medium grained sands with localized medium-to-coarse gravelly sand lenses. The sand zone at the water table contains the majority of the adsorbed-phase residual petroleum hydrocarbons.
- During the Investigation, water saturated conditions were generally first encountered in boreholes and monitor wells at depths ranging between approximately 11 to 12 feet. Depth to ground water measurements collected from the monitor wells in March, June and September 1999 indicates that the potentiometric water surface slopes to the south/southwest at a gradient of approximately 0.0015 feet/foot. Based on grain size distributions of selected soil samples, the hydraulic conductivity (K) of the upper portion of the saturated zone is approximately 1500 gpd/ft.
- Twelve (12) soil borings were advanced at the Site between February, May and June, 1999 using a CME-55 hollow-stem auger (HSA) drill rig supplied and operated by Rodgers Drilling, Inc. Seven of the borings were completed as monitor wells MW-1, MW-2, MW-3, MW-3D, MW-4, MW-5 and MW-6. The remaining soil borings were backfilled with activated bentonite and bentonite-cement grout following completion.
- During drilling activities, retrieved sediment samples were collected from the boreholes and analyzed in the field for Total Ionizable Volatile Compounds (TIVC) using either a Thermo-Environmental Instruments Model 580-B PID or a RAE-2000 PID, both of which utilize a 10.6 eV lamp. At each drilling location one or more sediment samples were also collected using the USTR Methanol Extraction Method for gasoline range hydrocarbons and standard methods for diesel and oil range hydrocarbons and were sent to Pinnacle Laboratories, Inc. for analyses. Laboratory samples were analyzed for Total Petroleum Hydrocarbons (C₆-C₃₆ carbon range) using EPA Method 8015 (modified) and BTEX and MTBE using EPA Method 8021.
- Select samples were also collected for analysis of Total Organic Carbon (TOC), grain size, percent moisture, clay content/plasticity, and heterotrophic bacterial population counts.
- On March 2, 1999 and June 10, 1999, FEI sampled ground water monitor wells at the Site. Prior to ground water sampling, depth to water was measured in each well with an electronic water level meter accurate to +/- 0.01 feet. Each well was then developed and purged by removing greater than or equal to three well volumes of water using a Grundfos sampling pump. Ground water samples collected by FEI were submitted to Pinnacle for analysis of BTEX, MTBE, EDC, and TMBs using EPA Method 8260, for EDB using EPA Method 504.1, and for naphthalenes by EPA Method 8270 (SIMS) and 8310. All groundwater samples collected for 8260 analysis were placed in 40-ml glass vials with teflon-lined lids. Sample vials were pre-preserved with an eight milligram/liter (mg/l)

solution of mercuric chloride to prevent sample degradation.

- Results of the investigation indicate that residual hydrocarbon contamination exists primarily as sorbed-phase TPH (primarily in the C₆ to C₁₀ and C₁₀ to C₂₂ hydrocarbon range – weathered gasoline and possibly diesel) in a medium grained sand layer lying at a depth of approximately 10 to 12 feet bgs.
- Low levels of BTEX components found in the ground water (except MW-1, which had a thin PSH sheen) in comparison to the residual TPH found in the overlying soils suggest that the leak is old and is probably reflective of a site that is reaching a mature stage of natural attenuation and is either shrinking in size or is in a state of hydrodynamic equilibrium.
- Although some residual contamination is apparent under the existing retail business buildings and under the Isleta Blvd. right-of-way, the majority of the contaminant mass appears to exist under the parking area between the on-site buildings and the right-of-way.
- Residual spill mass estimates indicate that approximately 5,000 pounds of hydrocarbons are present in the Pit Stop plume, primarily in the form of adsorbed-phase soil contamination.



2.2 RECOMMENDED ACTIONS

Task One – Site Review and Work Plan Development

This task provides for the review of FEI and NMED/USTB files, site mapping and photography, review of historic ground water and soils data, and final preparation of this work plan for additional investigation.

Task Two – Sample Existing Wells and Conduct Three Additional Quarterly Sampling Rounds

Groundwater in all usable wells will be sampled during an initial event for organic parameters including BTEX, MTBE, EDC, EDB, and naphthalene using EPA Method 8260. The following natural attenuation indicators will also be sampled for using field test kits: dissolved oxygen (DO), nitrate (NO₃), dissolved and total iron (Fe), alkalinity (HCO₃/CO₃), phosphate (PO₄), and sulfate (SO₄). Additional field tests will include pH, temperature, and conductivity. FEI/TPA will provide NMED/USTB and BCEHD 48-hour notification prior to initiating any sampling.

We also propose three additional quarters of ground water sampling for BTEX, TMB, EDB, EDC and MTBE using EPA Method 8021 (EDX) and for the above natural attenuation indicators. We propose sampling 7 wells in the second, third and fourth quarters. Ground water levels will be measured prior to sampling. Quarterly reports will be submitted according to the requirements of USTR §1216.

Task Three - Conduct AS/VE Pilot Test (Optional)

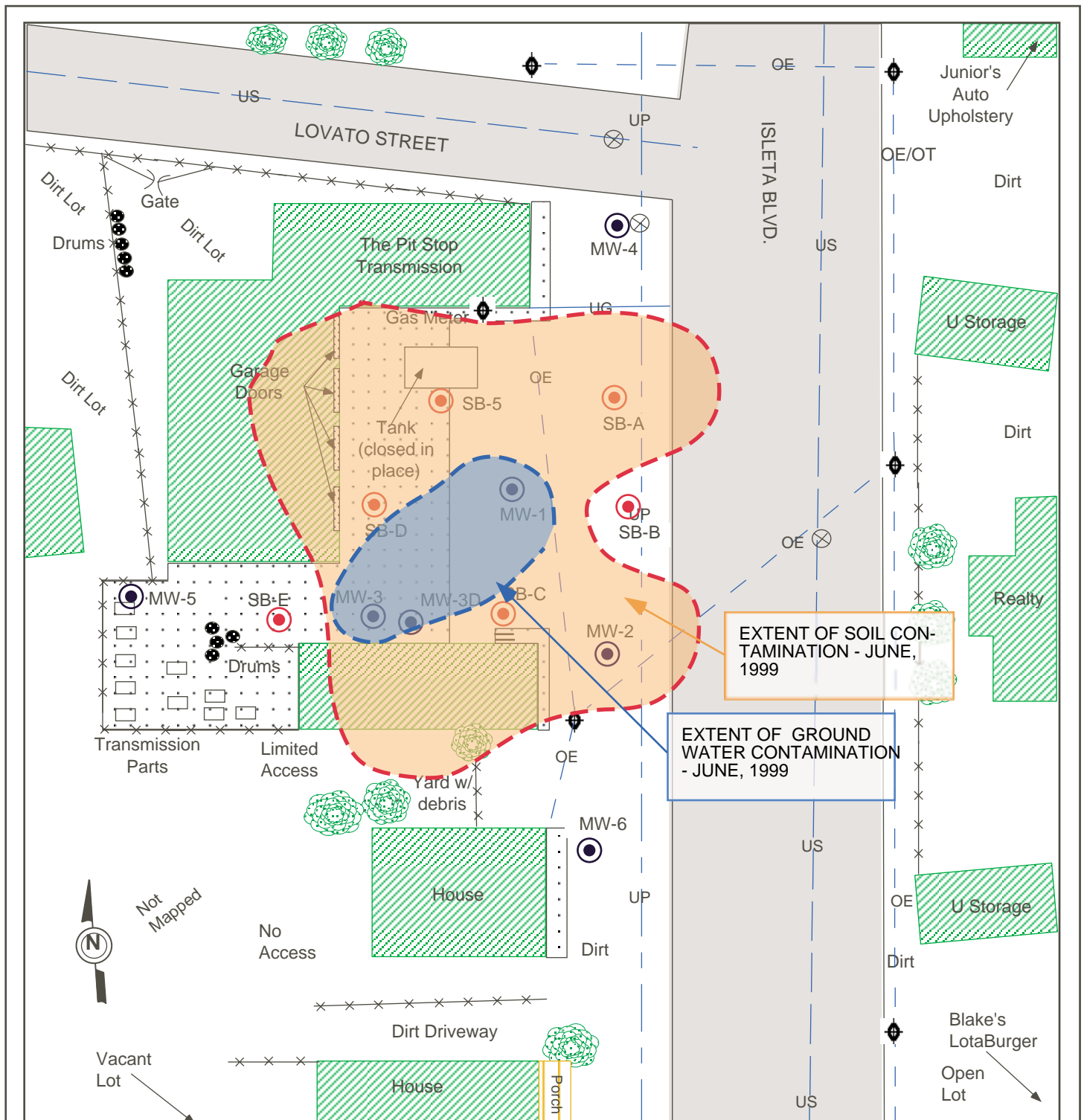
FEI/TPA recommends the implementation of a short-term AS/VE pilot test to evaluate remedial alternatives, the effects of short-circuiting, well spacing/zone(s) of influence, process water generation vs. applied vacuum, flow and vacuum responses, and off-gas emission concentration and composition. Data collected during the pilot test will be used to aid in design of the final reclamation system.

The pilot test will be conducted in two primary phases over a one-day period. Phase One will consist of in-situ VE testing on two newly installed high performance 4" diameter wells. In an effort to evaluate the effects of lithologic heterogeneity across the site, pilot testing will be conducted at two separate locations. Tentative test wells include VM-1 (primary test well) and VM-2 (see Figure 2B). Using strategically placed vadose/phreatic zone 1" diameter vacuum monitoring well clusters will allow measurement of vacuum responses and sparging effectiveness on a three dimensional basis during each portion of the pilot test. Phase One will be run for approximately four hours using wells VM-1 and VM-2 for approximately two hours each.

Phase Two will consist of operation of VM-1 and initiation of sparging into AS-1 for an approximate four hour period. In addition, during the sparge portion of the test, a tracer gas (helium or sulfur hexafluoride) will be injected into the sparging well at a known concentration. Samples will be collected from the VE well using a field detector to evaluate flow and travel time characteristics at the Site.

During the Phase One and Two portions of the test, four vapor samples will be collected in tedlar bags and sent to the laboratory for TPH and BTEX analysis using EPA method 8015 modified and 8021. In addition, three samples will also be analyzed for fixed gases (O₂, CO₂, N₂) and methane using standard EPA methodology.

Results of the pilot testing will be reported in the quarterly report following completion of the AS/VE test. At that time, and upon approval by the BCEHD and NMED, FEI/TPA will begin preparing a reclamation plan.



EXPLANATION:

Monitor Well

Soil Boring

Building

Concrete

Tree

Fence

Utility Pole

UTILITIES

UE Overhead Electric
UP Underground Phone
US Underground Sewer
UG Underground Gas

0 15 30ft

Scale

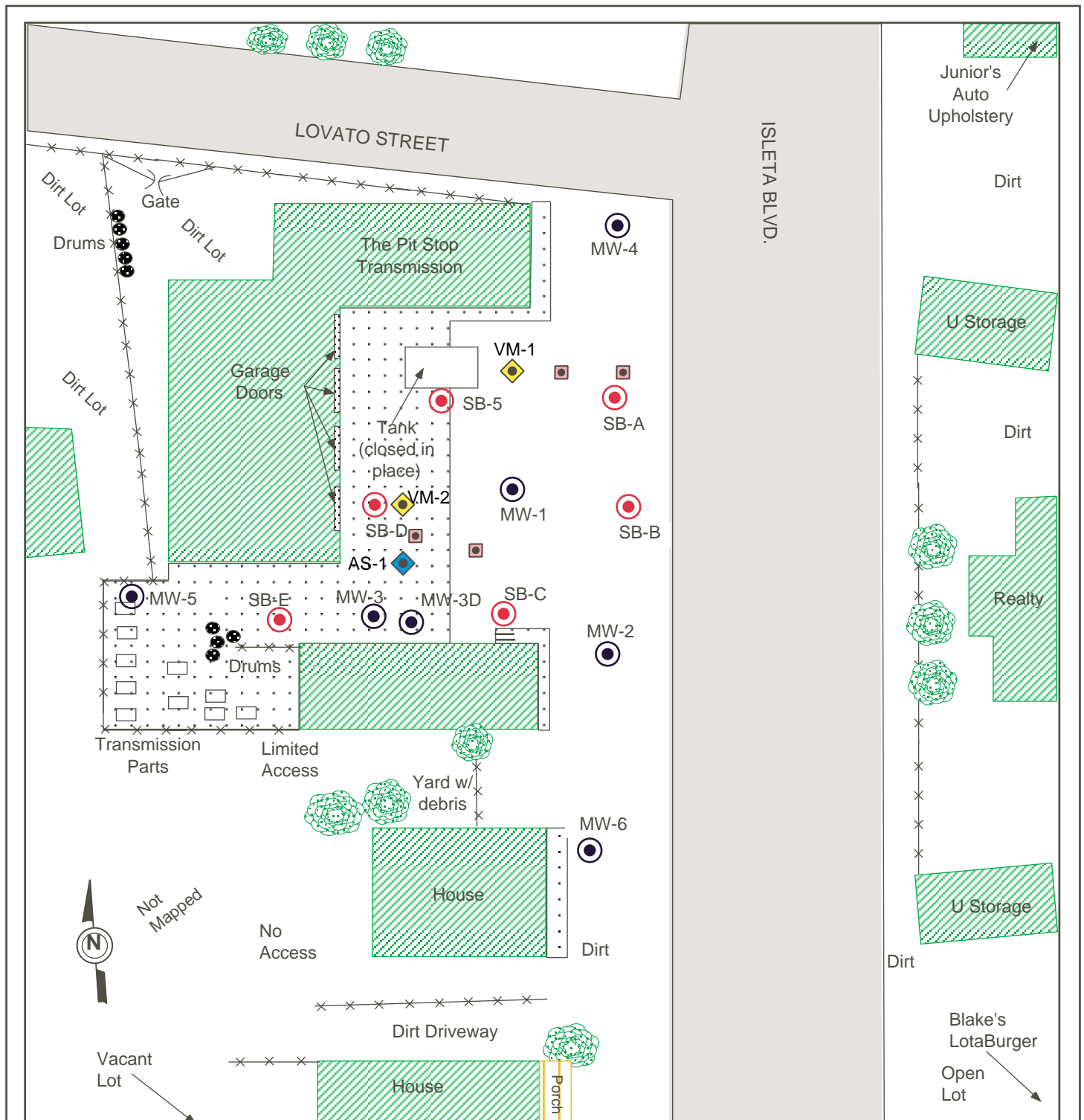
SITE MAP THE PIT STOP

305 Isleta SW, Albuquerque, New Mexico

Figure 2A
Historic Site map

FEI FAITH ENGINEERING, INC.

TECUMSEH



EXPLANATION:

- | | | | |
|--|--------------|--|--|
| | Monitor Well | | Proposed Air Sparging Well |
| | Soil Boring | | Proposed Dual Completion Pilot Test Well |
| | Building | | Proposed 4" Diameter Ve/ Monitor Well |
| | Concrete | | |
| | Tree | | |
| | Fence | | |
| | Utility Pole | | |
- 0 15 30ft
- Scale

SITE MAP

THE PIT STOP

305 Isleta SW, Albuquerque, New Mexico

Figure 2B

Proposed AS/VE Test Wells

FEI FAITH ENGINEERING, INC.



12/1/95•BJWR	0	NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — SUMMARY SHEET	
Site Name: The Pit Stop		Site Address: 305 Isleta SW Albuquerque, NM 87105	
Circle only one:	Circle only one:	Phase 2 — Free Product / Saturated Soil Recovery	Phase 4 — Reclamation Implementation
<input type="checkbox"/> Work plan	<input type="checkbox"/> Claim	<input type="checkbox"/> Phase 1 — Hydrogeo Investigation	<input type="checkbox"/> Phase 3 — Reclamation Proposal
		<input type="checkbox"/> Phase 5 — Operations and Maintenance	
FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5		NMED Use Only	
SUMMARY SHEET	TOTAL	Project Manager	Auditor
PROFESSIONAL SERVICES	\$11,760.00		
TAXABLE EXPENSES	\$3,318.25		
TAXABLE SUBCONTRACTORS	\$8,544.90		
TAXABLE SUBTOTAL	\$23,623.15		
NMGRT RATE 5.5625% X TAXABLE SUBTOTAL =	\$1,314.04		
TOTAL	\$24,937.19		
NONTAXABLE EXPENSES			
NONTAXABLE SUBCONTRACTORS			
NONTAXABLE SUBTOTAL			
GRAND TOTAL OF CLAIM	\$24,937.19		

NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — PROFESSIONAL SERVICES

Site Name: The Pit Stop**Site Address:** 305 Isleta SW
Albuquerque, NM 87105**Circle only one:**☒ **Work plan** ☐ **Claim****Circle only one:**☐ Minimum Site Assessment☒ Phase 1 — Hydrogeo Investigation☐ Phase 2 — Free Product /
Saturated Soil Recovery☐ Phase 3 — Reclamation Proposal☐ Phase 4 — Reclamation Implementation☐ Phase 5 — Operations and Maintenance

FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5

NMED Use Only

PROFESSIONAL SERVICES	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
initial sampling + 3 qtrs gw monitoring					\$7,100.00		
Pilot Testing					\$4,660.00		
SUBTOTAL					\$11,760.00		

NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — EXPENSES

Site Name: The Pit Stop

Site Address: 305 Isleta SW
Albuquerque, NM 87105

Circle only one:

☒ Work plan ☐ Claim

Circle only one:

☐ Minimum Site Assessment☒ Phase 1 — Hydrogeo Investigation☐ Phase 2 — Free Product /
Saturated Soil Recovery☐ Phase 3 — Reclamation Proposal☐ Phase 4 — Reclamation Implementation☐ Phase 5 — Operations and Maintenance

FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5

NMED Use Only

EXPENSES	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
NONTAXABLE							
N/A							
NONTAXABLE SUBTOTAL							
TAXABLE							
initial sampling + 3 qtrs gw monitoring					\$2,182.50		
Pilot Testing					\$1,135.75		
TAXABLE SUBTOTAL					\$3,318.25		

3.0 OLD HORN SITE – 430 ISLETA BOULEVARD, SW NMED Facility Number 301002

3.1 INTRODUCTION/SITE HISTORY

The Old Horn Site (the Site) is located at 430 Isleta Boulevard. Hydrocarbon releases were first discovered in the Old Horn Site vicinity when the owner of a mobile home park, Mr. C.O. Clark, complained of gasoline odors in his water supply well. Subsequent sampling of the well by the Albuquerque Environmental Health Department (AEHD) in 1991 identified trace levels of BTEX compounds in the well.

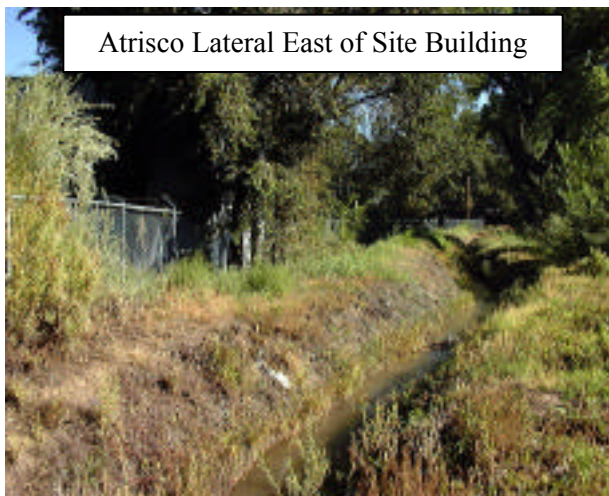


Former Old Horn Service Station looking NE

Based on a comprehensive review of available historical data, past Site knowledge, and completion of a detailed site inspection, FEI/TPA presents the following site summary. In addition, detailed maps were constructed summarizing known Site conditions (Figures 3A, 3B, and 3C).

- The Site has been the location of a series of gasoline service stations from the 1940's through the mid-1980's when any remaining USTs were reportedly removed from the Site. Like many of the older Isleta Sites, the Old Horn Site has experienced a complicated history of investigation and remediation activities.
- Initially, Western Technologies, Inc. (WTI) was retained by Mr. Calvin Horn to complete an On-site Investigation at the Old Horn Site. In January of 1992, WTI advanced and sampled three monitor wells and over 20 shallow soil borings in the Site vicinity (Figure 3A). Data collected during WTI's investigation revealed the presence of an extensive soil hydrocarbon plume with moderate levels of ground water BTEX. Although many borings were installed during this investigation, no laboratory TPH samples were collected and the boreholes were not continuously cored. Furthermore, the majority of soil headspace screening was conducted using an HNU-brand model 101 PID. This brand of PID has been shown by AEHD and NMED to underreport moderate to high levels of total ionizable volatile compound (TIVC) concentrations. For this reason, PID readings obtained with an HNU are presented as minimum values on Figure 3A.

- In early 1992, the NMED placed the Old Horn Site on its list of state-lead GWPA sites. Monteverde Environmental Consultants, Inc. (Monteverde), was retained by NMED to complete investigation activities and design and install a remediation system. Between 1992 and 1994, Monteverde installed and sampled additional monitor wells and soil borings in the Site vicinity. Exact locations for these drill holes could not be determined by FEI/TPA. The Monteverde base maps provided in their Hydrogeologic Investigation and Geotechnical Investigation Reports are an enlarged 1:24,000 scale USGS topographic map with the drilling locations drawn in by hand and a hand drawn base map. During this same period, Monteverde reported to have excavated approximately 250 cubic yards of soil from the former tank excavation area and installed a passive venting/active sparging in-situ reclamation system in the southernmost portion of the Site. An as-built report for this system was not identified in the NMED case file; however, the Monteverde system is discussed later by NMED's next consultant, Intera, Inc. (Intera). The approximate location for this reclamation system is shown in Figure 3C. Very little is known of its construction. This system was apparently never operated. Additionally, Intera reported that Monteverde also installed four pilot test wells, which were also never operated. No evidence of these pilot test wells was observed during FEI/TPA's site inspections in June and July of 1999.
- Intera was retained by NMED-USTB in late 1994. They conducted additional site investigations and installed additional wells and soil borings, which provided a more detailed understanding of the Site. Their investigations focused on the southern half of the Old Horn Site, which is believed to have been the area most highly contaminated.



- Shallow ground water flow has been calculated to flow south at a gradient of approximately 10^{-3} to 10^{-4} feet/foot. Depth to ground water is approximately 12 to 13 feet below ground surface (bgs). The Atrisco Lateral unlined irrigation canal is located immediately to the east and south of the Site. The lateral appears to effect ground water flow locally and cumulative ground water quality data suggest it has acted as a partial barrier to downgradient plume migration. However, additional down-gradient monitor wells are needed south of the lateral.
- Site geology appears to be primarily a coarsening downward sequence consisting of silts and clays grading to sands and gravelly sands at and above the water table. As part of our site review, FEI/TPA completed the cross section shown in Figure 3B using data obtained from WTI, Intera, and Monteverde drilling information. Additional cross sections for the locations shown in Figure 3A are

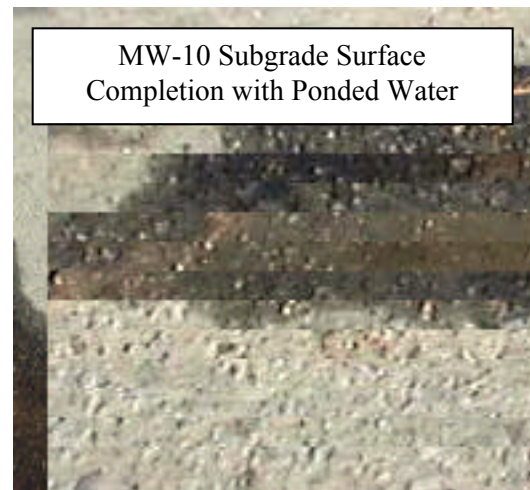
not included in this workplan and budget. The cross sections shown on Figure 3B provide further information regarding the site geology and contaminant distribution.

- Soil hydrocarbon impacts, as documented by PID and laboratory TPH soil analysis, suggest that several releases have occurred at the Old Horn Site, both from surface releases and from the former UST systems. Soils exceeding USTR standards appear to extend across an area of more than 400 feet by 200 feet in size (Figures 3A and 3C). Surface releases are suggested by the presence of soil impacts extending from the land surface to the water table. UST system releases are suggested by the presence of hydrocarbon hot spots in the vicinity of the former tank systems. Previous sampling identified the presence of gasoline and minor diesel range hydrocarbon Phase Separated Hydrocarbon (PSH) in the vicinity of monitor well MW-10 and gasoline range-only PSH in the vicinity of monitor well MW-1B. The PSH identified in MW-10 appears significantly more degraded than the PSH found in MW-1B.
- Intera conducted a short-term AS/VE pilot test at the Site in November 1994. The pilot test consisted of installation and operation of a single dual-completed sparge and vent well (shown as #7 on Figure 3C). This well was installed at a location equidistant between MW-10 and SB-A (Figure 3A). Four 1" diameter galvanized iron pipes (vacuum observation points) were driven into the ground at distances of 8', 19', 23', and 30' from Well Nest #7. The location of these wells and whether just the open end of the pipe or a screened interval was used to measure vacuum responses is unknown, based on available data. Intera calculated a radius of influence based on their pilot test of 45 to 55 feet. Our analysis suggests the effective zone of vacuum influence (EZVI) for the test well is approximately 30 feet. This assumes a 3% normalized response, which we have used to define the EZVI. Off-gas emission concentrations based on laboratory analysis of a single recovered vapor sample were approximately 16,000 ug/l (3700 ppm/v). Total BTEX concentrations amounted to less than 400 ug/l (90 ppm/v)
- The Pit Stop leaking UST site is located approximately 500 feet to the north. The former Phil's Auto leaking UST site is located approximately 1000 feet to the south of the Site. Long-term ground water quality data indicate neither of these plumes appears to have impacted or co-mingled with the Old Horn plume.
- In 1995, Intera installed 14 AS/VE well nests and associated subgrade piping in the southern portion of the Old Horn Site (Figure 3C). These wells apparently have never been operated. Inspection of the Site by FEI/TPA in 1999 identified the primary subsurface PVC manifold headers for the system in the southernmost portion of the Site (see Photograph). Review of the Intera Reclamation Proposal confirms that the treatment wells are manifolded in such a way



that each “leg” of the system can be turned on or off, however, individual well control is not possible.

- Each sparge and vent well nest is reportedly completed with the sparge and vent well in the same borehole. Bentonite seals reportedly isolate the screened intervals of each well cluster. Surface completions allowing access to the AS/VE wells were not constructed and all wells and piping are subgrade. Vent wells are reported to be constructed of 2” diameter schedule 40 PVC with 0.02” slot screen and sparge wells are constructed of 2” diameter schedule 40 PVC with 0.01” slot screen. According to the Intera Reclamation Proposal, the well screens are backfilled with crushed gravel. Horizontal piping in the vicinity of the manifold valving is 3” diameter PVC. The current condition of the subgrade treatment system is unknown.
- It should also be noted that many of the original monitor wells installed at the Site have been damaged, destroyed, or lost (Figure 3A). Some surface well completions, such as MW-10, are set into the surrounding asphalt and tend to accumulate surface water runoff during the wet season.
- Following installation of the AS/VE system, two ground water-sampling events were conducted at the Site; one in 1996 and one in 1998. These data document reductions in dissolved phase BTEX and PSH in select wells (Figure 3A).
- Initial sampling of monitor wells MW-1, MW-2, and MW-3 by WTI in 1992 identified the presence of BTEX and methyl-ethyl-ketone (MEK) and acetone at levels of up to 590 ppb each.



3.2 EXISTING SITE CONDITIONS

Based on the above data, the following deficiencies need to be addressed:

- Although many previous boreholes were installed in the Old Horn Site vicinity, the data collected during these investigations is either out-of-date or incomplete. The presence of multiple release(s) has likely complicated the pattern of contamination at the Site. Many of the original monitor wells are destroyed and/or unusable. Much of the northern and western portions of the contaminant plume are incompletely characterized. TPH soil samples were collected from the Site during the Intera investigation only. The Site needs to be re-sampled for the presence of MEK and Acetone.
- The western and southern extents of ground water hydrocarbon impacts have not been characterized.

- The original Monteverde remediation system appears to have major vacuum leaks in piping and/or treatment wells based on limited testing of the system by Intera. FEI/TPA does not recommend use of this system without further examination. This system should be properly plugged and abandoned.
- The Intera AS/VE system needs to be inspected to determine system status after 4 years of abandonment. Repaving of portions of the site with asphalt may have resulted in damage to horizontal piping runs and wells.
- Vacuum short-circuiting in the subsurface is likely to be a problem for future remedial activities unless existing non-usable reclamation system components are properly plugged and abandoned.

3.3 RECOMMENDED ACTIONS

Task One – Site Review and Work Plan Development

This task provides for the review of NMED/USTB files, site mapping and photography, review of historic ground water and soils data, and final preparation of this work plan for additional investigation.

Task Two - Sample Existing Wells and Conduct Three Additional Quarterly Sampling Rounds

Ground water in all usable wells (seven existing wells) will be sampled during an initial event for organic parameters including BTEX, MTBE, EDC, EDB, MEK, acetone, and naphthalene using EPA Method 8260. The following natural attenuation indicators will also be sampled for using field test kits: dissolved oxygen (DO), nitrate (NO₃), dissolved and total iron (Fe), alkalinity (HCO₃/CO₃), phosphate (PO₄), and sulfate (SO₄). Additional field tests will include pH, temperature, and conductivity. FEI/TPA will provide NMED/USTB and BCEHD 48-hour notification prior to initiating any sampling.

We also propose three additional quarters of ground water sampling for BTEX, TMB, EDB, EDC and MTBE using EPA Method 8021 (EDX) and for the above natural attenuation indicators. We propose sampling 9 wells in the second quarter, 12 wells in the third quarter and 9 wells in the fourth quarter.

During each sampling event ground water levels will be measured prior to sampling. Collected data will be used to define drilling locations as needed in Task Three below. New locks and well caps will be installed on all usable monitoring wells. Quarterly reports will be submitted according to the requirements of USTR §1216.

Task Three - Hydrogeologic Investigation

General - Characterize the magnitude and extent of soil and ground water contamination in the Site vicinity through advancement and sampling of soil borings and monitor wells. Tentative drilling locations are shown in Figure 3C. Off-site access will be required for several drilling locations. For the purposes of cost estimation and based on a comprehensive review of the Site data we propose the following number of soil borings and wells:

Projected Drilling Activity

- 20 - Soil borings
- 7 - 2" diameter shallow completion monitor wells
- 2 - 4" diameter Multi-Use Monitor/VE wells w/high flow screen (*see below*)
- 1 - 2" diameter deep completion monitor/AS well
- 6 - 1" diameter multiple completion pilot test wells (*see below*)

All soil borings will be sampled on a continuous basis using either 2-foot long split spoons or 5 foot long core barrels. PID headspace analysis will be conducted on retrieved soil samples at five-foot intervals or less and at the water table. One to two laboratory soil samples will be collected from each drilling location and analyzed for TPH (gasoline-diesel range) using EPA method 8015 modified and for BTEX and MTBE using EPA Method 8021. Samples will be collected for gasoline-range compounds using methanol extraction kits and unpreserved 4-oz jars for diesel-range compounds. New ground water monitoring wells installed during this task will be sampled and analyzed for the same EPA 8260 hydrocarbon parameters, natural attenuation indicators and field tests which were described for the initial well sampling in Task 2. Additionally, all new and existing wells will be surveyed to a common USGS (or other) established Mean Sea Level benchmark datum by a NM licensed surveyor.

We recommend conducting an AS/VE pilot test to evaluate the potential for upgrade of the existing remedial system. To minimize mobilization costs and maximize soil and groundwater data collection, we recommend that several of the proposed drilling locations be completed as multi-use 4" diameter wells and 1" diameter pilot vacuum test well clusters. Pilot testing will be conducted on the existing AS/VE remedial system and at newly installed high performance 4" diameter pilot test wells. FEI/TPA proposes the use of separate boreholes for completion of air sparging and vacuum extraction wells.

Aquifer Hydraulic Properties - Pursuant to the requirements of the USTR Part XII, Section 1210, FEI/TPA recommend evaluation of Site hydrogeologic properties through laboratory testing of retrieved sediment samples. Data collected from these activities will be used to determine grain size distribution, grain and bulk density, specific permeability (k) and effective porosity (n). Hydraulic properties such as storativity, transmissivity (T), and hydraulic conductivity (K) can then be estimated using sediment sample data. This information will then be used to calculate average ground water and contaminant migration rates, which are necessary in risk assessment calculations and/or determination of potential remedial alternatives. We recommend two monitor well locations to collect discrete sediment samples for laboratory characterization. Two samples will be collected from each location; one in the vadose zone, one in the shallow saturated zone. In addition to the above, two of the samples will also be analyzed for total organic carbon content (TOC).

We also recommend biological characterization of select retrieved soil samples for plate count analysis of total microbial populations and total hydrocarbon degrading populations in a laboratory setting. One

sample will be collected from the vadose zone and one from the phreatic zone. These data will provide useful information regarding the potential for enhanced biodegradation of hydrocarbons at the Site.

Repair Select Wells - Monitor wells MW-6 and MW-10 need their surface completions repaired. In addition, two 3" diameter PVC risers extending to ground water (?) are located in the general vicinity of MW-1. These may be old Monteverde pilot test wells and should be plugged and abandoned as they represent conduits for migration of surface contaminants to the water table.

Task Four - Completion of the Hydrogeologic Investigation (HI) Report

Upon receipt of all field data, FEI/TPA will prepare a summary HI report. This Report will include geologic and contaminant distribution cross sections, isoconcentration maps, a ground water isocontour map, appropriate tables, and text summarizing the results of the investigation as they relate to plume characterization and site remediation, and the requirements of the USTR. In addition, residual hydrocarbon spill mass estimates will be included.

Task Five - Conduct AS/VE Pilot Test and Evaluate Portions of the AS/VE remediation system. (Optional)

We recommend evaluation of the current condition of the AS/VE system, which has been abandoned in place for nearly four years. The condition of subgrade piping and the condition of treatment wells should be evaluated. We also recommend the implementation of a short-term AS/VE pilot test to better evaluate remedial alternatives, the effects of short-circuiting, well spacing/zone(s) of influence, process water generation vs. applied vacuum, flow and vacuum responses, and off-gas emission concentration and composition. Data collected during the pilot test will be used to aid in determining the best remedial approach for the Old Horn Site, which may involve upgrade and expansion of the existing remedial system. Due to the many site complexities, the pilot test will be conducted in two primary phases over a two-day period.

Phase One will consist of in-situ VE and AS testing on previously installed AS/VE well nest #6 and VE testing on one of the three manifold lines exposed along the southern portion of the property. Prior to testing, the well nest will be uncovered and the adjacent horizontal piping exposed in an effort to evaluate current well conditions and to allow for individual hookup to an above-ground VE blower and AS compressor. Using existing monitor wells in conjunction with proposed strategically placed vadose/phreatic zone 1" diameter vacuum monitoring well clusters will allow measurement of vacuum responses and sparging effectiveness on a three dimensional basis during each portion of the pilot test.

Initially, a vacuum will be placed on the VE portion of Nest #6 for a two-hour period. Surrounding wells will be monitored. Vacuum and flow will be increased in step fashion to evaluate optimal conditions and determine the breakthrough point for two-phase flow from the well. Once optimal flow conditions have been evaluated, air sparging will be initiated into the AS portion of Nest #6. Combined AS/VE will be continued for an additional 6-hour period. Following this primary test, vacuum and flow will be applied in a similar fashion to one of the vacuum lines for an additional two-hour period. The total test period for

the first day is projected to be approximately 10 hours. Dissolved oxygen concentrations will be measured in monitor wells during the test and after 24 hours. Four vapor samples will be collected in tedlar bags during day one and sent to the laboratory for TPH and BTEX analysis using EPA method 8015 modified and 8021. In addition, two samples will be analyzed for fixed gases and methane using standard EPA methodology.

Phase Two will consist of in-situ VE testing in VM-1, a newly installed high performance 4" diameter well, and combined in-situ AS/VE at newly installed wells, VM-2 and AS-1 (see above). Day two testing will evaluate the effectiveness of larger diameter, more efficient treatment wells at the Site. In an effort to evaluate the effects of lithologic heterogeneity across the Site, short-circuiting from the previously installed reclamation systems and potential zone of effectiveness beneath Isleta Boulevard, day two pilot testing will be conducted at two separate locations. Initially, vacuum and flow will be applied in VM-1 (Figure 3C). As presented above, vacuum and flow will be applied in a step-wise fashion to identify the most efficient operating configuration vs. water generation. Subsequently, a two-hour VE-only test followed by a combined 6-hour VE/AS test will be conducted in VM-2 (Figure 3C). This test will allow direct comparison of the high performance 4" diameter wells with earlier installed 2" diameter AS/VE well nests.

Dissolved oxygen concentrations will be measured in monitor wells during the test and after 24 hours. In addition, during the sparge portion of the test, a tracer gas (helium or sulfur hexafluoride) will be injected into the sparging well at a known concentration. Samples will be collected from the VE well using a field detector to evaluate flow and travel time characteristics at the Site. Four vapor samples will also be collected in tedlar bags during day two and sent to the laboratory for TPH and BTEX analysis using EPA method 8015 modified and 8021. In addition, two samples will also be analyzed for fixed gases and methane using standard EPA methodology.

EXPLANATION:

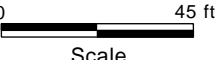
MW-4A Existing Monitor Well Location

Sampling Date	
B=	Benzene
T=	Toluene
E=	Ethyl Benzene
X=	Total Xylenes
TMB=	Tri-methyl Benzene
M=	(MTBE) Methyl-Tertiary Butyl Ether
All concentrations in Parts Per Billion (ppb)	

MW-4 Former Monitor Well Location (destroyed)

Existing Soil Boring Location

- Building
- Concrete
- Asphalt
- Fence Line
- Utility Lines
 - Underground Gas Line
 - Underground Water Line
 - Underground Fiber Optics
 - Overhead Electric
- Utility Pole
- Manhole



Depth	
10'	726
OVM PID Reading In PPM·V	
Data from WT, Monteverde, Inc., and Intera, Inc.	

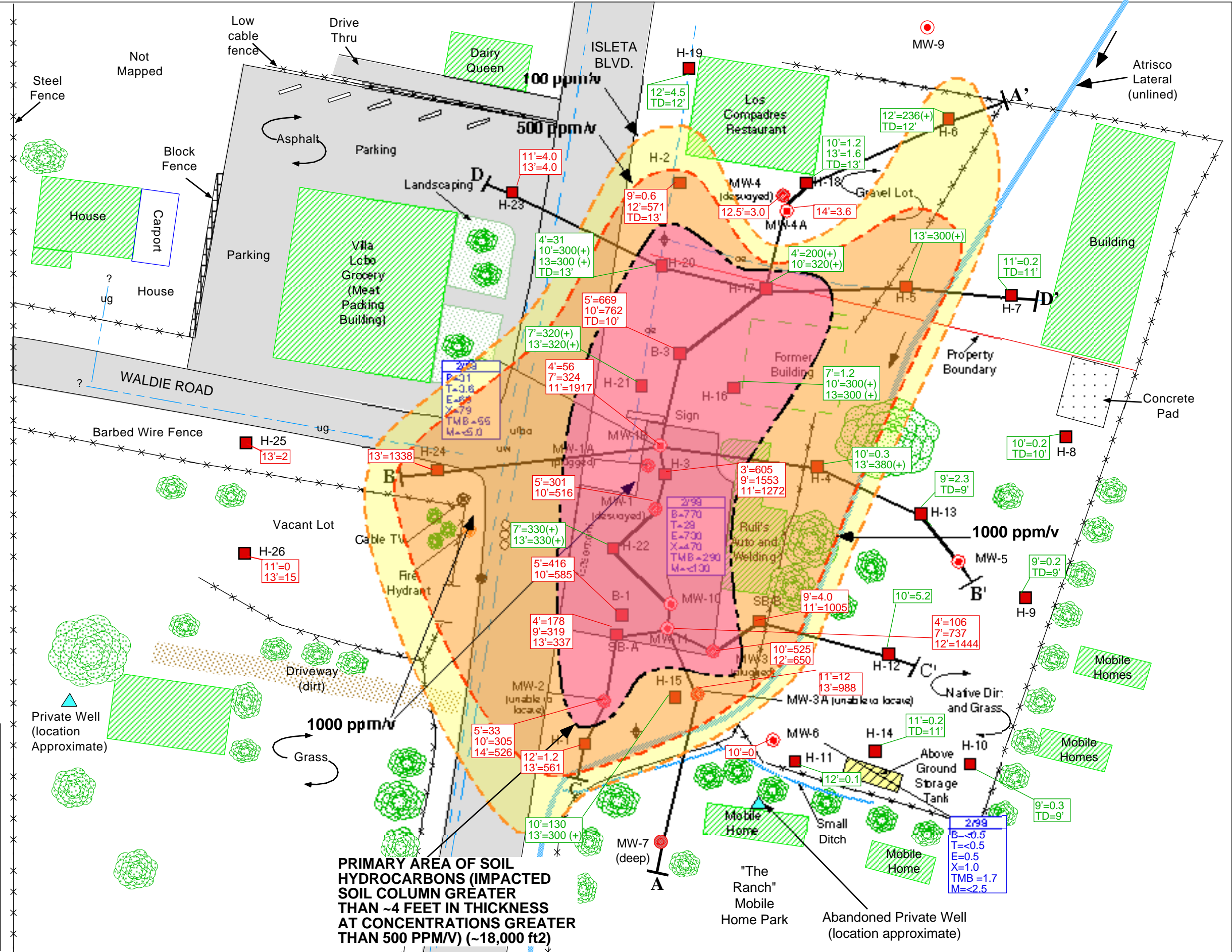
Depth	
10'	5.2
HNU PID Reading In PPM·V	
Data From WT, Inc.	

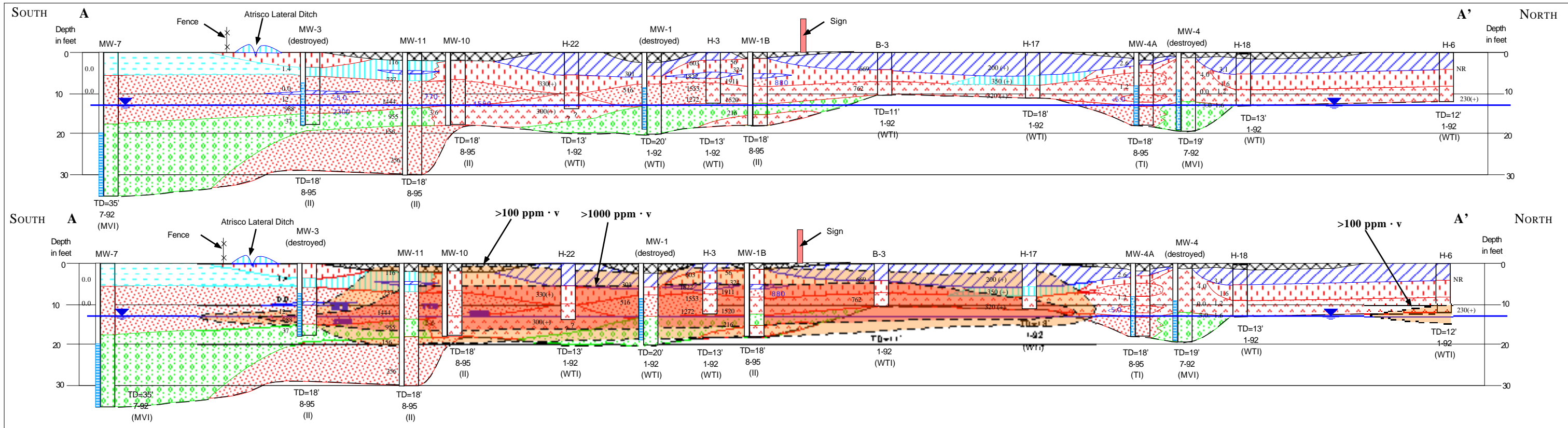
Soil and Groundwater Quality Summary Map (1992 to 1998)
Old Horn Site
430 Isleta Blvd., SW
Albuquerque, New Mexico

FEI FAITH ENGINEERING, INC.

TECUMSEH
PROFESSIONAL ASSOCIATES, INC.

Drawn by:	WJB	6/99	Client: BCEHD
Drafted by:	ABL	6/99	Job # 035-001
Reviewed by:	WJB	6/99	Figure: 3A





EXPLANATION:

Lithology	Fill Material/Asphalt	ML Silt, clayey or sandy (low clay content)
GW Silty to sandy gravel	CL Clay (high clay content)	
SW Poorly sorted sand		
SP Well sorted sands		
SM Well sorted sands		
SC Clayey sand (low clay content)		

Well or Borehole Identification

MW-10

Well or Borehole Identification

Simplified Lithology

PID Headspace reading (in ppm · v)

Laboratory TPH Concentration in ppm

Screen Interval

Water Level

Total Depth

Date of Drilling

Oversight Contractor

Scale 1.5x Vertical Exaggeration

WTI = Western Technologies, Inc.
MVI = Monteverde Consultants, Inc.
II = Intera, Inc.

100 ppm · v

100 ppm

Total Ionizable Volatile Compounds Isoconcentration (TIVC) Concentration in ppm · v

Total Petroleum Hydrocarbon (TPH) Isoconcentrations

This Cross Section is an interpretation of available data. Some variations may be expected from actual site conditions.

Simplified Geologic and Contaminant Cross Section A-A'

Old Horn Site 430 Isleta Blvd., SW

FEI FAITH ENGINEERING, INC.

TECUMSEH

PROFESSIONAL ASSOCIATES, INC.


Drawn by:	WJB	6/99	Client: BCEHD
Drafted by:	ABL	6/99	Job # 035-001
Approved by:	WJB	8/99	Figure: 3B


EXPLANATION:

MW-4A  Existing Monitor Well Location





Sampling Date	
B=	Benzene
T=	Toluene
E=	Ethyl Benzene
X=	Total Xylenes
TMB=	Tri-methyl Benzene
M=	(MTBE) Methyl-Tertiary Butyl Ether
All concentrations in Parts Per Billion (ppb)	

MW-4  Former Monitor Well Location (destroyed)



 Previous Soil Boring Location

 SVVS™ Well Location (approximate)

 Monteverde Sparge Well Location (approximate)

 Building  Concrete
 Fence Line  Asphalt

Utility Lines
—ug— Underground Gas Line
—uw— Underground Water Line
—ufbo— Underground Fiber Optics
—oe— Overhead Electric

 Utility Pole 0 45 ft
 Manhole Scale

Depth
10'=726
OVM PID Reading In PPM·V
Data from WT, Monteverde, Inc., and Intera, Inc.

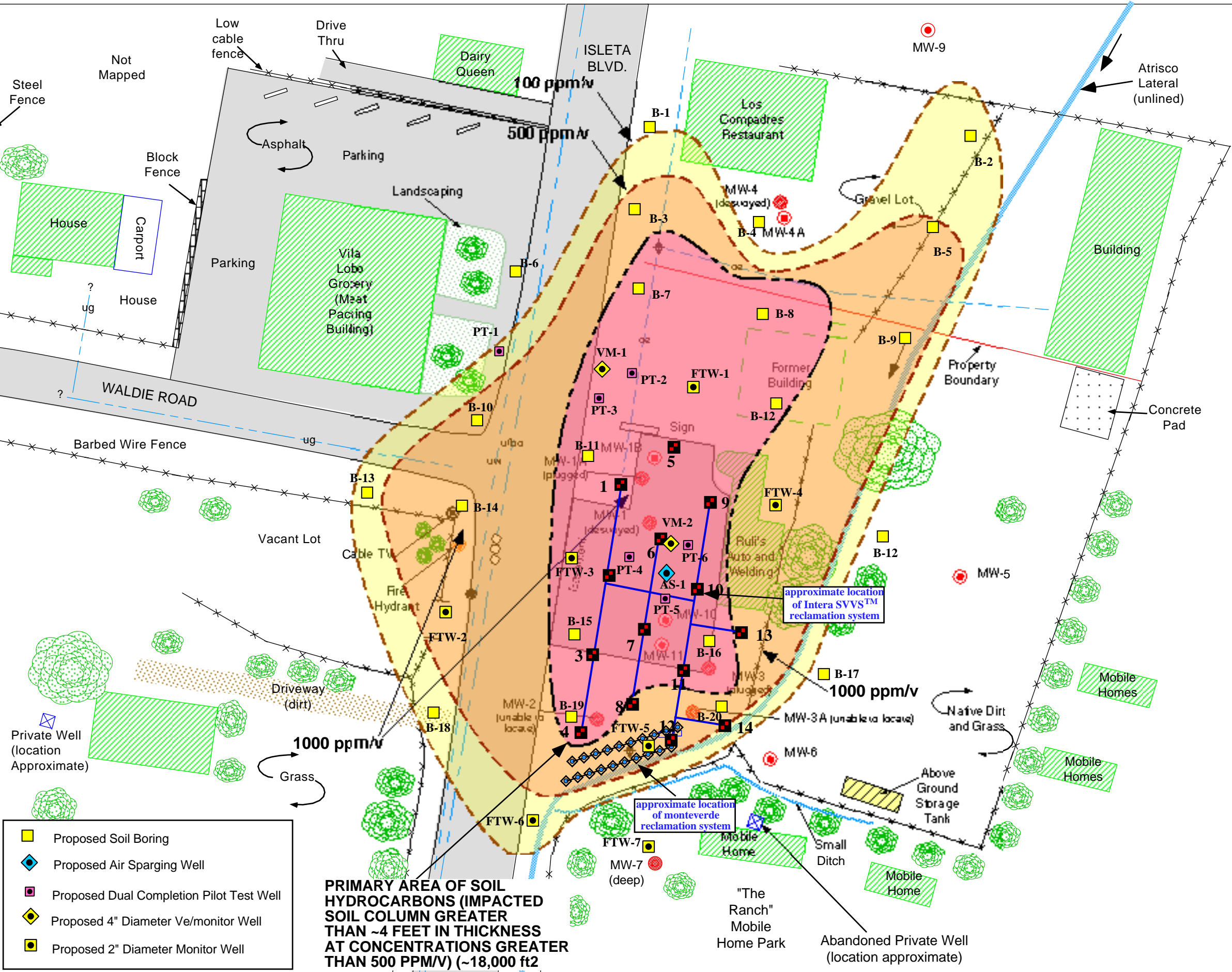
Depth
10'=5.2
HNU PID Reading In PPM·V
Data From WT, Inc.

Proposed Drilling and Pilot Test Locations
Old Horn Site
430 Isleta Blvd., SW
Albuquerque, New Mexico

FEI FAITH ENGINEERING, INC.



Drawn by:	WJB	8/99	Client: BCEHD
Drafted by:	ABL	8/99	Job # 035-001
Reviewed by:	WJB	8/99	Figure: 3C



12/1/95•BJWR	0	NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — SUMMARY SHEET	
Site Name: Old Horn		Site Address: 430 Isleta SW Albuquerque, NM 87105	
Circle only one:	Circle only one:	Phase 2 — Free Product / Saturated Soil Recovery	Phase 4 — Reclamation Implementation
<input type="checkbox"/> Work plan	<input type="checkbox"/> Claim	<input type="checkbox"/> Phase 1 — Hydrogeo Investigation	<input type="checkbox"/> Phase 3 — Reclamation Proposal
		<input type="checkbox"/> Phase 5 — Operations and Maintenance	
FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5		NMED Use Only	
SUMMARY SHEET	TOTAL	Project Manager	Auditor
PROFESSIONAL SERVICES	\$38,680.00		
TAXABLE EXPENSES	\$6,138.00		
TAXABLE SUBCONTRACTORS	\$30,607.50		
TAXABLE SUBTOTAL	\$75,425.50		
NMGRT RATE 5.5625% X TAXABLE SUBTOTAL =	\$4,195.54		
TOTAL	\$79,621.04		
NONTAXABLE EXPENSES			
NONTAXABLE SUBCONTRACTORS			
NONTAXABLE SUBTOTAL			
GRAND TOTAL OF CLAIM	\$79,621.04		

12/1/95•BJWR

NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — PROFESSIONAL SERVICES

Site Name: Old Horn**Site Address:** 430 Isleta SW
Albuquerque, NM 87105**Circle only one:**☒ **Work plan** ☐ **Claim****Circle only one:**

Minimum Site Assessment

☒ **Phase 1 — Hydrogeo Investigation**Phase 2 — Free Product /
Saturated Soil Recovery

Phase 3 — Reclamation Proposal

Phase 4 — Reclamation Implementation

☐ **Phase 5 — Operations and Maintenance**

FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5

NMED Use Only

PROFESSIONAL SERVICES	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
initial sampling + 3 qtrs gw monitoring					\$12,920.00		
Drilling & Sampling (Hydrogeologic Investigation					\$10,560.00		
Hydrogeologic Report					\$10,080.00		
Pilot Testing					\$5,120.00		
TOTAL UNITS							
SUBTOTAL					\$38,680.00		

NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — EXPENSES

Site Name: Old Horn

Site Address: 430 Isleta SW
Albuquerque, NM 87105

Circle only one:

☒ **Work plan** ☐ **Claim**

Circle only one:

Minimum Site Assessment

☒ Phase 1 — Hydrogeo InvestigationPhase 2 — Free Product /
Saturated Soil Recovery

Phase 3 — Reclamation Proposal

Phase 4 — Reclamation Implementation

☐ Phase 5 — Operations and Maintenance

FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5

NMED Use Only

EXPENSES	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
NONTAXABLE							
N/A							
NONTAXABLE SUBTOTAL							
TAXABLE							
initial sampling + 3 qtrs gw monitoring					\$2,037.00		
Drilling & Sampling (Hydrogeologic Investigation)					\$2,572.00		
Hydrogeologic Report					\$567.00		
Pilot Testing					\$962.00		
TOTAL UNITS							
TAXABLE SUBTOTAL					\$6,138.00		

4.0 PHIL'S AUTO SITE – 701 ISLETA BOULEVARD, SW NMED Facility Number 5517001

4.1 INTRODUCTION/SITE HISTORY

The Phil's Auto Site (the Site) is located at 701 Isleta Boulevard SW. Hydrocarbon releases were first discovered in the Site vicinity in July 1987, when hydrocarbon odors were reported in a nearby private water well. NMED subsequently identified at least five private wells located west and southwest of the Site. NMED sampling of these wells identified BTEX compounds in two of the wells. The facility is no



longer used to dispense fuels and is currently operated by Mr. Phil Moya as an automotive repair facility.

Based on a comprehensive review of available historical data, past Site knowledge, and completion of a detailed site inspection, FEI/TPA presents the following site summary. In addition, detailed maps were constructed summarizing known Site conditions (Figures 4A and 4B).

- The Site was used to dispense fuel for several decades. Based on available site data, three USTs containing gasoline were formerly located along the northern side of the property (Figure 4A). Analysis of inventory records indicated a cumulative loss of over 8,500 gallons from the unleaded and regular UST systems. These tanks were removed from the ground in October 1993.
- In 1990, Resources Technology, Inc. (RTI) was retained by the responsible party to conduct a site investigation. RTI installed and sampled three wells at the Site (MW-1, MW-2, and MW-3) and advanced temporary soil gas/groundwater sampling points at 10 additional locations to the south and west of the Site. No TPH soil samples were collected during the investigation. Data collected during their investigation revealed the presence of a soil and groundwater BTEX contaminant plume extending south and southwest of the station.
- In 1993 the NMED retained Gram and Associates, Inc. (Gram) to conduct site investigation activities as part of the GWPA State lead program. Gram conducted a two-stage investigation during 1993,

during which seven new monitor wells and five boreholes were advanced and sampled at the Site. Their investigations documented a southwesterly trending groundwater BTEX contaminant plume extending several hundred feet off-site. Unfortunately, during their investigations, TPH soil data was not collected in any of the drilling locations and no boreholes or wells were installed in the tank pit area. The magnitude and extent of the soil contaminant plume was not characterized to the west, north, east or southeast (Figure 4A).



- Based on Gram's Investigation, depth to static groundwater at the Site has been measured to be approximately 11 to 12 feet below ground surface (bgs). Calculated shallow groundwater flow is to the south-southwest at a gradient of approximately 0.0006 feet/foot. Site lithology, as reported in borehole logs, appears to be a coarsening downward sequence consisting primary of silty sands and fine to medium grained sands grading to coarser grained sands near and below the water table.
- Phase Separated Hydrocarbon (PSH) was identified at levels up to 5" in thickness in monitor wells MW-1, MW-2, MW-4, and MW-5. Soil laboratory BTEX values from soil samples collected from these locations appear anomalistically low, considering PSH was identified at each of these locations. Gram collected laboratory soil samples above the air-water interface in the soil borings above the primary zone of contamination.
- In 1994, Intera, Inc. (Intera) was retained by NMED to design and install a remediation system. Intera submitted a reclamation proposal to NMED in April 1994 for installation of a SVVSTM in-situ reclamation system. A short-term pilot test for the site was performed on a combination sparge/vent well cluster located in the northern portion of the site (Figure 4B). Intera reported induced flows of up to 60 standard cubic feet/minute (scfm) at a vacuum of only 4" of H₂O, indicating a highly transmissive subsurface environment. Sparging was also initiated at the Site at a reported rate of 23 scfm at approximately 4.7 psi. Intera calculated a radius of influence for the VE well to be greater than 20 feet. Based on the induced flow and vacuum, this number is likely to be even higher.
- The approximate extent of soil hydrocarbon contamination prior to remedial efforts is shown in Figure 4A. TPH soil contamination was likely concentrated in the central and northern vicinity of the Site. Analysis of laboratory chromatograms suggests gasoline contaminants at the Site were weathered in nature. A larger diameter vapor-phase hydrocarbon zone likely surrounds the TPH contamination core.

- An in-situ SVVSTM reclamation system was installed at the Site in 1995 and began operation in September 1995. The reclamation system consists of 33 combination sparge/vent well nests manifolded via underground PVC piping to an aboveground treatment unit. Wells were constructed of 2" diameter, schedule 40 PVC with crushed stone surrounding the vent wells and 10-20 silica sand surrounding the sparge wells. Bentonite seals were emplaced between the screened intervals and the land surface. The above ground treatment unit consists of a 300 scfm catalytic oxidizer and vent and sparge blowers. The system operated between September 1995 and early 1996 when it was shutdown.
- During our recent site inspection, above ground treatment equipment appeared to be in good condition. The majority of the monitor wells observed at the Site also appeared to be in good condition, with the exception of MW-8, which was reported as destroyed during reclamation system installation. Off-site downgradient wells were not inspected due to site access restrictions.
- The most recent 1998 groundwater sampling of select monitor wells at the Site documented significant reductions in BTEX concentrations in monitor wells MW-1, MW-2, MW-4, and MW-10. During the 1998 sampling event, PSH was not documented in monitor wells MW-2 and MW-4, as had been the case during previous sampling events. Current dissolved-phase groundwater quality is unknown.



Catalytic Oxidizer and Equipment Compound

4.2 EXISTING SITE CONDITIONS

Based on the above data, the following potential deficiencies need to be further evaluated:

- The current monitor well network is inadequate to define the magnitude and extent of remaining ground water contaminants.
- Remedial design of the treatment system does not allow for individual operation of well nests. Instead, three manifold well boxes (see photograph next page; Figure 4A) are located at the Site which allow adjustment of groups of wells. This type of arrangement often leads to the creation of “dead zones” in the subsurface between treatment wells where little or no remediation has occurred.



- The soil hydrocarbon plume at the Site has never been fully characterized, especially in the vicinity of the former tank pit. In addition, post-remedial characterization of the soil/PSH source area needs to be documented, especially between treatment well nests. These borings should be continuously sampled for lithology and analyzed for soil TPH and BTEX.
- Adjacent private water supply wells need to be re-sampled, as do existing monitor/remediation wells.

4.3 RECOMMENDED ACTIONS

Task One – Site Review and Work Plan Development

This task provides for the review of NMED/USTB files, site mapping and photography, review of historic ground water and soils data, and final preparation of this work plan for additional investigation.

Task Two – Sample Existing Wells and Conduct Three Additional Quarterly Sampling Rounds

Ground water in all usable wells (eight existing wells) will be sampled during an initial event for organic parameters including BTEX, MTBE, EDC, EDB, and naphthalene using EPA Method 8260. The following natural attenuation indicators will also be sampled for using field test kits: dissolved oxygen (DO), nitrate (NO₃), dissolved and total iron (Fe), alkalinity (HCO₃/CO₃), phosphate (PO₄), and sulfate (SO₄). Additional field tests will include pH, temperature, and conductivity. FEI/TPA will provide NMED/USTB and BCEHD 48-hour notification prior to initiating any sampling. We also propose three additional quarters of groundwater sampling for BTEX, TMB, EDB, EDC and MTBE using EPA Method 8021 (EDX) and for the above natural attenuators. We propose sampling 10 wells in the second quarter, 14 wells in the third quarter and 10 wells in the fourth quarter.

During each sampling event, ground water levels will be measured prior to sampling. Collected data will be used to define drilling locations as needed in Task Three below. New locks and well caps will be installed on all usable monitoring wells. Quarterly reports will be submitted according to the requirements of USTR §1216.

Task Three - Hydrogeologic Investigation

General – FEI/TPA will characterize the magnitude and extent of post-remedial soil and ground water contamination in the Site vicinity through advancement and sampling of soil borings and monitor wells. Tentative drilling locations are shown in Figure 4B. Off-site access will be required for several drilling locations. For the purposes of cost estimation and based on a comprehensive review of the Site data, we propose the following number of soil borings and wells:

Projected Drilling Activity

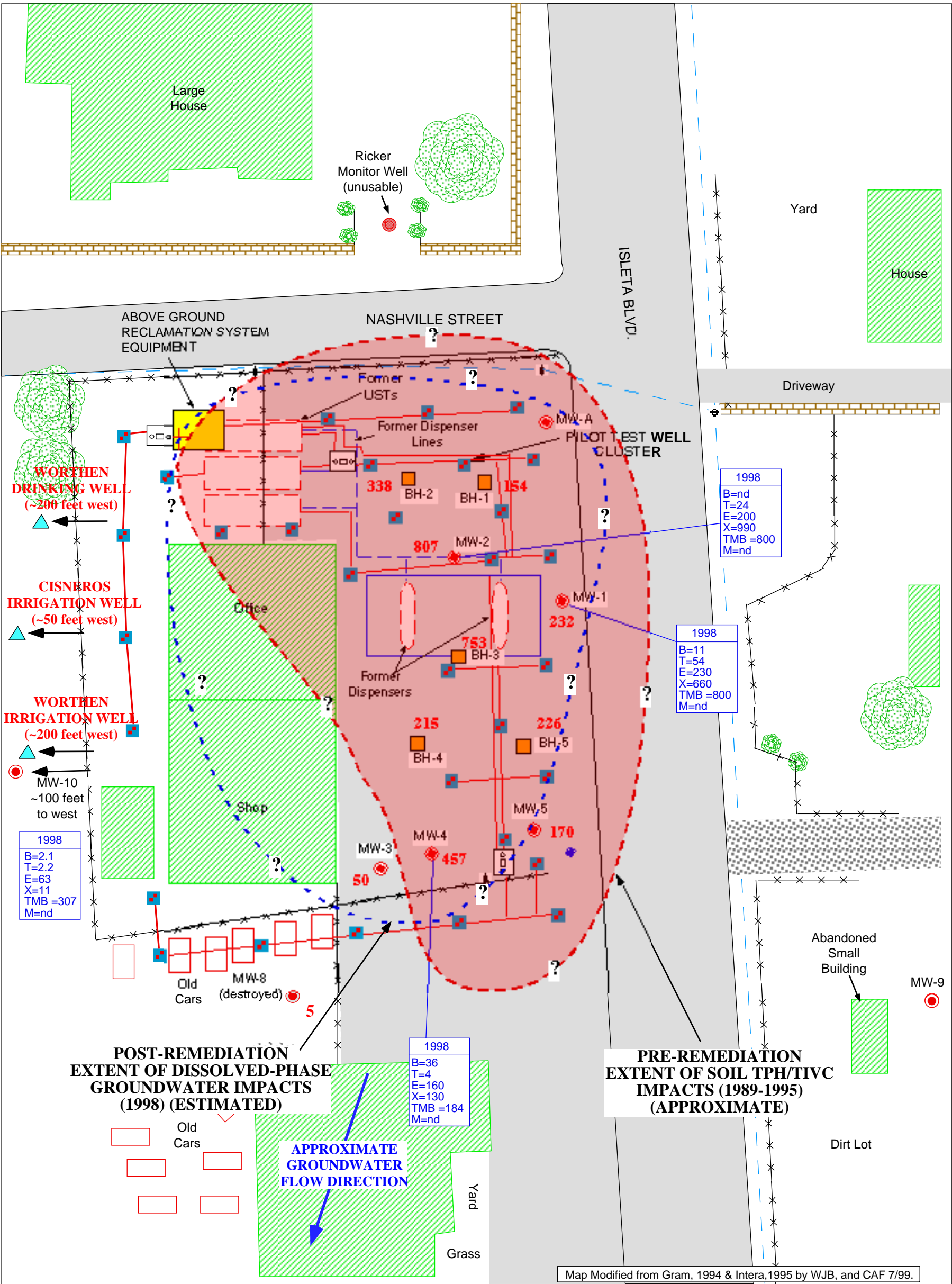
- 11 - Soil borings
- 5 - 2" diameter shallow completion monitor wells

All soil borings will be sampled on a continuous basis using either 2-foot long split spoons or 5 foot long core barrels. PID headspace analysis will be conducted on retrieved soil samples at five-foot intervals or less and at the water table. One to two laboratory soil samples will be collected from each drilling location and analyzed for TPH (gasoline-range) using EPA method 8015 modified and for BTEX and MTBE using EPA Method 8021. Samples will be collected for gasoline-range compounds using methanol extraction kits. New ground water monitoring wells installed during this task will be sampled and analyzed for the same EPA 8260 hydrocarbon parameters, natural attenuation indicators and field tests which were described for the initial well sampling in Task 2. Additionally, all new and existing wells will be surveyed to a common USGS (or other) established Mean Sea Level benchmark datum by a NM licensed surveyor.

Task Four - Completion of the Hydrogeologic Investigation (HI) Report

Upon receipt of all field data, FEI/TPA will prepare a summary HI Report. This Report will include geologic and contaminant distribution cross sections, isoconcentration maps, a ground water isocontour map, appropriate tables, and text summarizing the results of the investigation as they relate to plume characterization and site remediation, and the requirements of the USTR. In addition, residual hydrocarbon spill mass estimates will be included.

At this time we do not recommend testing of the on-site remedial system. Should Tasks Two and Three indicate the need for further remedial action, the reclamation system can be examined in more detail.



Map Modified from Gram, 1994 & Intera, 1995 by WJB, and CAF 7/99.

EXPLANATION:

● Present Monitor Well Location

Sampling Date

B=Benzene
T=Toluene
E=Ethyl Benzene
X=Total Xylenes
TMB=Tri-Methyl Benzenes
M=(MTBE)

All concentrations in Parts Per Billion (ppb)

● Monitor Well Lost or Destroyed

■ Soil Boring Location (approximate)

215 PID Reading in ppm/v (data from RTI, 1990; Gram, 1994)

■ Previously Installed Sparge/Vent Well Cluster

▲ Private Water Supply Well

■ Building

■ Asphalt

OE Overhead Electric Power Pole

Well Control Box

Subsurface Piping

Adobe or Brick Wall

○ ○ ○ Fence

○ ○ ○ Vegetation

0 15 30ft Scale

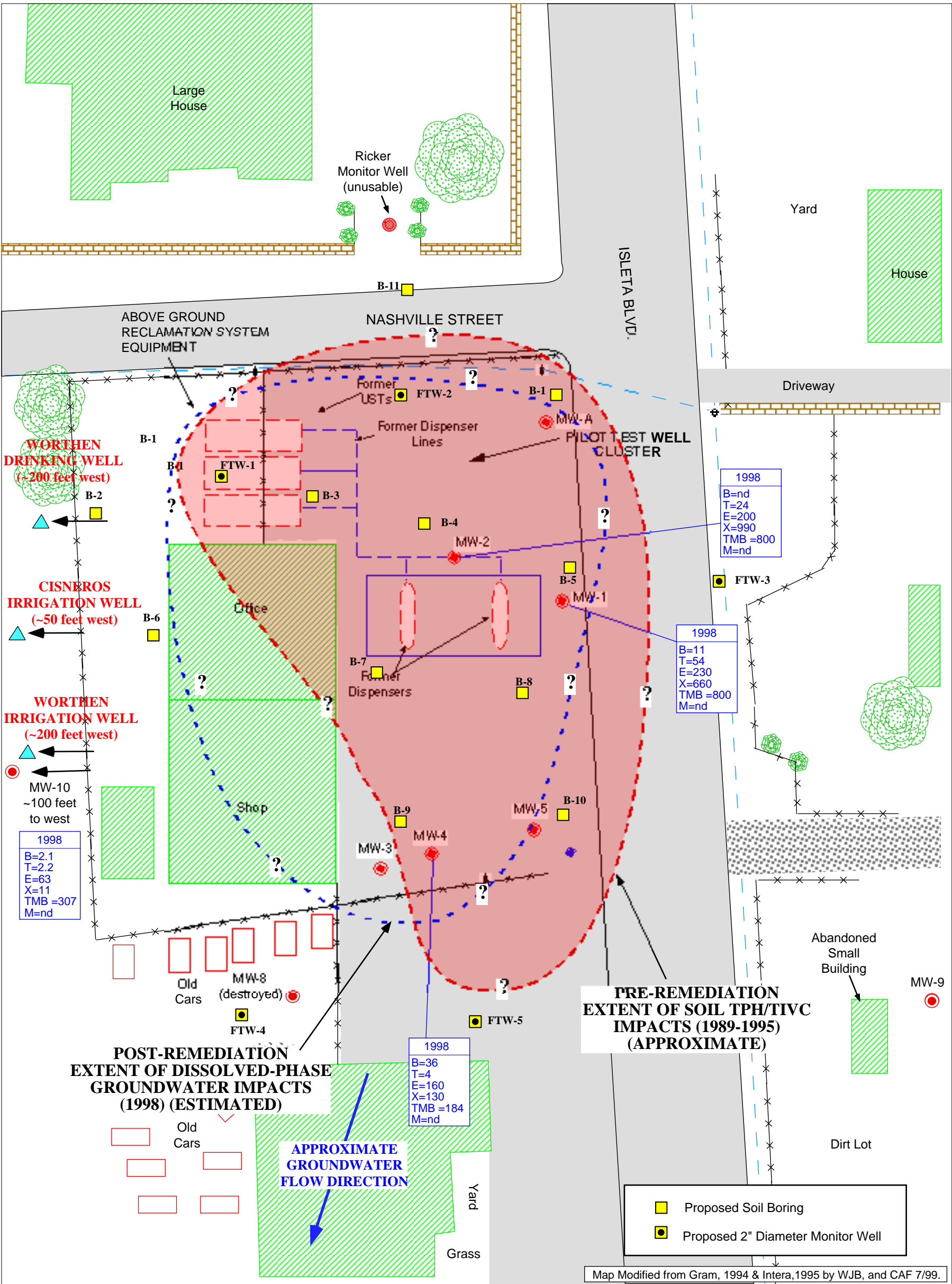
Soil and Groundwater Quality Summary Map

Phil's Auto Site
701 Isleta Blvd., SW
Albuquerque, New Mexico

FEI FAITH ENGINEERING, INC.

TECUMSEH PROFESSIONAL ASSOCIATES, INC.

Drawn by:	WJB	7/99	Client: BCEHD
Drafted by:	ABL	7/99	Job # 035-001
Reviewed by:	WJB	7/99	Figure: 4A



EXPLANATION:

- Present Monitor Well Location
- Sampling Date
- B=Benzene
- T=Toluene
- E=Ethyl Benzene
- X=Total Xylenes
- TMB=Tri-Methyl Benzenes
- M=(MTBE)
- All concentrations in Parts Per Billion (ppb)
- Monitor Well Lost or Destroyed
- Soil Boring Location (approximate)
- 215 PID Reading in ppm/v (data from RTI, 1990; Gram, 1994)
- Previously Installed Sparge/Vent Well Cluster
- Private Water Supply Well

Legend:

- Building
- Asphalt
- Overhead Electric Power Pole
- Well Control Box
- Subsurface Piping
- Adobe or Brick Wall
- Fence
- Vegetation

Scale: 0 15 30ft

Proposed Drilling Locations

Phil's Auto Site
701 Isleta Blvd., SW
Albuquerque, New Mexico

FEI FAITH ENGINEERING, INC.		TECUMSEH PROFESSIONAL ASSOCIATES, INC.
Drawn by:	WJB	7/99
Drafted by:	ABL	7/99
Reviewed by:	WJB	7/99
Client: BCEHD		Job # 035-001
Figure: 4B		

12/1/95•BJWR	0	NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — SUMMARY SHEET	
Site Name: Phil's Auto		Site Address: 701 Isleta SW Albuquerque, NM 87105	
Circle only one: <div style="border: 1px solid black; display: inline-block; padding: 2px;">Work plan</div> <i>Claim</i>	Circle only one: Minimum Site Assessment <div style="border: 1px solid black; display: inline-block; padding: 2px;">Phase 1 — Hydrogeo Investigation</div>	Phase 2 — Free Product / Saturated Soil Recovery	Phase 4 — Reclamation Implementation
		Phase 3 — Reclamation Proposal	<div style="border: 1px solid black; display: inline-block; padding: 2px;">Phase 5 — Operations and Maintenance</div>
FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5		NMED Use Only	
SUMMARY SHEET	TOTAL	Project Manager	Auditor
PROFESSIONAL SERVICES	\$28,480.00		
TAXABLE EXPENSES	\$4,921.00		
TAXABLE SUBCONTRACTORS	\$13,500.90		
TAXABLE SUBTOTAL	\$46,901.90		
NMGRT RATE 5.5625% X TAXABLE SUBTOTAL =	\$2,608.92		
TOTAL	\$49,510.82		
NONTAXABLE EXPENSES			
NONTAXABLE SUBCONTRACTORS			
NONTAXABLE SUBTOTAL			
GRAND TOTAL OF CLAIM	\$49,510.82		

NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — PROFESSIONAL SERVICES

Site Name: Phil's Auto**Site Address:** 701 Isleta SW
Albuquerque, NM 87105**Circle only one:**☒ **Work plan** ☐ **Claim****Circle only one:**☐ Minimum Site Assessment☒ Phase 1 — Hydrogeo Investigation☐ Phase 2 — Free Product /
Saturated Soil Recovery☐ Phase 3 — Reclamation Proposal☐ Phase 4 — Reclamation Implementation☐ Phase 5 — Operations and Maintenance

FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5

NMED Use Only

PROFESSIONAL SERVICES	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
initial sampling + 3 qtrs gw monitoring					\$12,440.00		
Drilling & Sampling (Hydrogeologic Investigation)					\$7,620.00		
Hydrogeologic Report					\$8,420.00		
Pilot Testing							
Site Review							
SUBTOTAL					\$28,480.00		

NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — EXPENSES

Site Name: Phil's Auto

Site Address: 701 Isleta SW
Albuquerque, NM 87105

Circle only one:

☒ Work plan ☐ Claim

Circle only one:

Minimum Site Assessment

☒ Phase 1 — Hydrogeo InvestigationPhase 2 — Free Product /
Saturated Soil Recovery

Phase 3 — Reclamation Proposal

Phase 4 — Reclamation Implementation

☐ Phase 5 — Operations and Maintenance

FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5

NMED Use Only

EXPENSES	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
NONTAXABLE							
N/A							
NONTAXABLE SUBTOTAL							
TAXABLE							
initial sampling + 3 qtrs gw monitoring					\$2,422.00		
Drilling & Sampling (Hydrogeologic Investigation					\$1,992.00		
Hydrogeologic Report					\$507.00		
Pilot Testing							
Site Review							
TAXABLE SUBTOTAL					\$4,921.00		

Site Address: 701 Isleta SW
Albuquerque, NM 87105

Phase 5 — Operations and Maintenance

NMED Use Only

SUBCONTRACTORS	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
NONTAXABLE							
N/A							
NONTAXABLE SUBTOTAL							
TAXABLE							
initial sampling + 3 qtrs gw monitoring					\$2,423.40		
Drilling & Sampling (Hydrogeologic Investigation					\$11,077.50		
Hydrogeologic Report							
Pilot Testing							
Site Review							
TAXABLE SUBTOTAL					\$13,500.90		

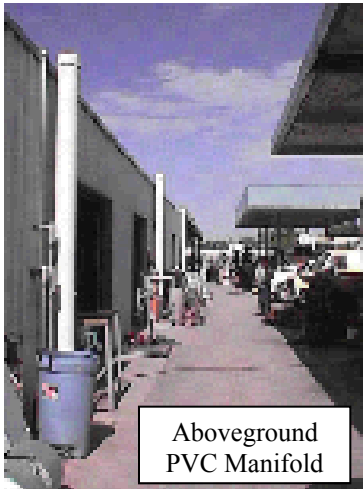
5.0 RODGERS DRILLING SITE – 2615 ISLETA BOULEVARD SW NMED Facility Number 11017001

5.1 INTRODUCTION/SITE HISTORY

Based on a comprehensive review of available historical data, past Site knowledge, and completion of a detailed site inspection, FEI/TPA completed the following site summary. In addition, detailed maps were constructed summarizing known Site conditions and are presented as Figures 5A and 5B.



- Hydrocarbon releases were first identified at the Site in the 1980's during removal of the former USTs (Figure 5A). Based on limited laboratory analysis of soil samples, both gasoline and diesel fuels were released at the Rodgers Site.
- Shallow ground water flow has been calculated to flow south-southeast at a gradient of approximately 10^{-4} ft/foot. Depth to ground water is approximately 7 to 8 feet below ground surface (bgs). Site geology is poorly characterized, however, it appears to be primarily composed of sands with lesser amounts of silts and clays.
- The property immediately north of the Site was previously the location of Sparkle Car Wash. Gasoline hydrocarbon releases have been documented from former USTs at the Sparkle Site (Figure 5A). Excavation and disposal of a large portion of the soils in the tank pit and long-term monitoring by the responsible party suggest that the Sparkle plume is relatively restricted in size, is partially remediated, and has not co-mingled with the adjacent Rodgers plume.
- Investigation and remediation activities have been conducted in two primary episodes at the Rodgers Site. Initially, Metric Corporation (Metric) was retained by the responsible party. In 1990, Metric installed a series of shallow completion monitor wells in the Site vicinity which identified a large dissolved-phase BTEX and MTBE hydrocarbon plume with localized phase separated hydrocarbons.



- In 1991 Metric, on behalf of the responsible party, installed a passive vadose zone aeration system in the vicinity of the former tanks (Figure 5A). This system involved excavation of six approximately 45 to 50 foot long trenches extending to the water table. Slotted PVC well screen was set horizontally in these trenches and manifolded to aboveground wind turbines. The trenches were then backfilled with sand and gravel and an asphalt cap applied. Additionally, approximately 150 cubic yards of impacted soils were reportedly removed from the former UST location.

- In 1992, NMED included the Rodgers Site on its list of GWPA State Lead remediation projects. NMED retained Billings and Associates, Inc. (BAI) to evaluate site conditions and design and implement an enhanced remedial strategy. As part of an abbreviated investigation BAI advanced and sampled a series of 12 soil borings along the northern and southern margins of the Rodgers property. Soil boring logs could not be located in the NMED case file. Limited PID and TPH analyses were conducted on retrieved soil samples, the results of which are shown in Figure 5A.

- Apparently three primary soil hydrocarbon source areas are present in the Site vicinity; one located at the Sparkle Site and two others located at the Rodgers Site. It is possible, due to the limited soil TPH data, that the two apparent Rodgers soil plumes actually connect beneath the building as a single larger plume.
- BAI subsequently installed an in-situ AS/VE remediation system that consists of two primary lines of sparge and vent wells, which are shown in Figure 5A. A line of 20 sparge/vent well clusters are located at approximately 19-foot intervals along the south side of the Rodgers building and an additional line of 7 well clusters are located along the north side of the Rodgers property. Evidence of the northern line of wells was identified in the field. The exact location of the southern line of wells could not be ascertained as all components are buried. Based on the scale and generalized nature of the BAI site map, it is unclear whether the southern line of wells is inside or outside of the fencing along the Rodgers/AutoZone property boundary. Discussions with Rodgers's personnel also failed to determine the exact location of the southern line of wells.
- According to the BAI reclamation system as-built report (1992), vent wells were constructed via hand auguring techniques using 2" diameter schedule 40 PVC with a single foot of 0.01"-slot screen set from approximately 3 to 4 feet bgs. Approximately 0.5 feet of bentonite seal is emplaced from approximately 2.5 to 3.0 feet bgs. Sparge wells were reportedly installed by hand-auguring a 4" diameter borehole to the static water table at approximately 7-8 feet bgs. 1.5" diameter casing with a single foot of well screen set at the base was then driven to a total depth of approximately 15 feet bgs.

An approximately 1-foot thick bentonite seal was set in each sparge well borehole annulus at the water table followed by backfill of unknown origin.

- Sparge and vent wells are manifolded via below grade and above-grade 2" diameter schedule 40 PVC piping to several small VE and AS blowers housed in the northwest corner of the Rodgers Site (Figure 5A). Examination of the above ground piping indicates it is in poor condition (see photo). The condition of the blowers could not be ascertained as the storage buildings originally housing the blowers were locked.
- The AS/VE system was operated for approximately 3 years prior to shutdown. Laboratory TPH and BTEX samples were not reported from the off-gas stack emissions throughout this period. However, samples were analyzed using a PID. Maximum PID readings on vapors recovered from the southern leg of the system reportedly did not exceed 10 ppm/v. The northern leg was located nearer the source area and yielded off-gas PID concentrations of greater than 700 ppm/v during initial system operation. Overall maximum combined stack emissions were initially reported as high as 1700 ppm/v. Total hydrocarbons removed from the Site are unknown.
- BAI documented reductions in BTEX and MTBE concentrations in on-site monitor wells. However, re-sampling of select ground water monitoring wells in 1998 following shutdown of the reclamation system identified increased BTEX concentrations in several wells. It should also be noted that monitor well W-4 has been lost or destroyed and was previously the most contaminated well at the Site.



5.2 EXISTING SITE CONDITIONS

Based on the above data, the following deficiencies need to be addressed:

- Site lithology and the magnitude and extent of hydrocarbon contamination have never been fully characterized at the Site. Many of the original monitor wells are silted up or dry and unusable.
- Engineering analysis indicates the use of 2" diameter PVC piping for all manifold lines throughout the system results in significant head flow losses in medial to distal wells. Horizontal distances from the blowers to the distal wells are over 500 feet in length. These distances, combined with the use of low horsepower regenerative blowers, will limit system effectiveness. Furthermore, horizontal piping was never pressure tested and was reportedly buried at only 18" bgs. It is likely that in many of the higher traffic areas, piping has been crushed due to heavy traffic loading.

- Vacuum short-circuiting in the subsurface is likely to be a significant problem at the Site both from the Metric-designed system and from possible improper backfilling of soil borings in the same general location as the AS/VE wells.
- None of the VE wells are manifolded for individual operation. System operation with all wells turned on likely creates “dead zones” in many areas of the Site where little or no remediation is occurring.
- It is likely that the hydrocarbon source area has not been fully remediated. The re-emergence of benzene at high concentrations in monitor well W-11 confirms this hypothesis.

5.3 RECOMMENDED ACTIONS

Task One – Site Review and Work Plan Development

This task provides for the review of NMED/USTB files, site mapping and photography, review of historic ground water and soils data, and final preparation of this work plan for additional investigation.

Task Two – Sample Existing Wells and Conduct Three Additional Quarterly Sampling Rounds

Ground water in all usable wells (eighteen existing wells) will be sampled during an initial event for organic parameters including BTEX, MTBE, EDC, EDB, and naphthalene using EPA Method 8260. The following natural attenuation indicators will also be sampled for using field test kits: dissolved oxygen (DO), nitrate (NO₃), dissolved and total iron (Fe), alkalinity (HCO₃/CO₃), phosphate (PO₄), and sulfate (SO₄). Additional field tests will include pH, temperature, and conductivity. FEI/TPA will provide NMED/USTB and BCEHD 48-hour notification prior to initiating any sampling.

We also propose three additional quarters of groundwater sampling for BTEX, TMB, EDB, EDC and MTBE using EPA Method 8021 (EDX) and for the above natural attenuators. We propose sampling 12 wells in the second quarter, 15 wells in the third quarter and 12 wells in the fourth quarter.

During each sampling event, groundwater levels will be measured prior to sampling. Collected data will be used to define drilling locations as needed in Task Three below. New locks and well caps will be installed on all usable monitoring wells. Quarterly reports will be submitted according to the requirements of USTR §1216.

Task Three - Hydrogeologic Investigation

General – FEI/TPA will characterize the magnitude and extent of soil and ground water contamination in the Rodgers Site vicinity through advancement and sampling of soil borings and monitor wells. Tentative drilling locations are shown in Figure 5B. Off-site access will be required for several drilling locations. For the purposes of cost estimation and based on a comprehensive review of the Site data we propose the following number of soil borings and wells:

Projected Drilling Activity

- 17 - Soil borings
- 2 - 2" diameter shallow completion monitor wells
- 8 - 4" diameter Multi-Use Monitor/VE wells w/high flow screen (*see below*)
- 1 - 2" diameter deep completion monitor/AS well
- 5 - 1" diameter multiple completion pilot test wells (*see below*)

All soil borings will be sampled on a continuous basis using either 2-foot long split spoons or 5-foot long core barrels. PID headspace analysis will be conducted on retrieved soil samples at five-foot intervals or less and at the water table. One to two laboratory soil samples will be collected from each drilling location and analyzed for TPH (gasoline-diesel range) using EPA method 8015 modified and for BTEX and MTBE using EPA Method 8021. Samples will be collected for gasoline-range compounds using methanol extraction kits and unpreserved 4-oz jars for diesel-range compounds. New ground water monitoring wells installed during this task will be sampled and analyzed for the same EPA 8260 hydrocarbon parameters, natural attenuation indicators and field tests which were described for the initial well sampling in Task 2. Additionally, all new and existing wells will be surveyed to a common USGS (or other) established Mean Sea Level benchmark datum by a NM licensed surveyor.

At the Rodgers Site, we recommend conducting an AS/VE pilot test to evaluate potential remedial alternatives. Site access in many of the proposed drilling locations is a serious logistical problem. For this reason, we recommend many of the new wells be constructed as multi-use 4" diameter wells or 1" diameter pilot test vacuum well clusters to avoid future drilling disruption at the Site and maximize data collection.



Aquifer Hydraulic Properties - Pursuant to the requirements of the USTR Part XII, Section 1210, FEI/TPA recommend evaluation of Site hydrogeologic properties through laboratory testing of retrieved sediment samples. Data collected from these activities will be used to determine grain size distribution, grain and bulk density, specific permeability (k) and effective porosity (n). Hydraulic properties such as storativity, transmissivity (T), and hydraulic conductivity (K) can then be estimated using sediment sample data. This information will then be used to calculate average ground water and contaminant migration rates, which are necessary in risk assessment calculations and/or determination of potential remedial alternatives. We recommend two monitor well locations to collect discrete sediment samples for laboratory characterization. Two samples will be collected from each location; one in the

vadose zone and one in the shallow saturated zone. In addition to the above, two of the samples will also be analyzed for total organic carbon content (TOC).

Task Four - Completion of the Hydrogeologic Investigation (HI) Report

Upon receipt of all field data, FEI/TPA will prepare a summary HI report. This Report will include geologic and contaminant distribution cross sections, isoconcentration maps, a ground water isocontour map, appropriate tables, and text summarizing the results of the investigation as it relates to plume characterization and site remediation, and the requirements of the USTR. In addition, residual hydrocarbon spill mass estimates will be included.

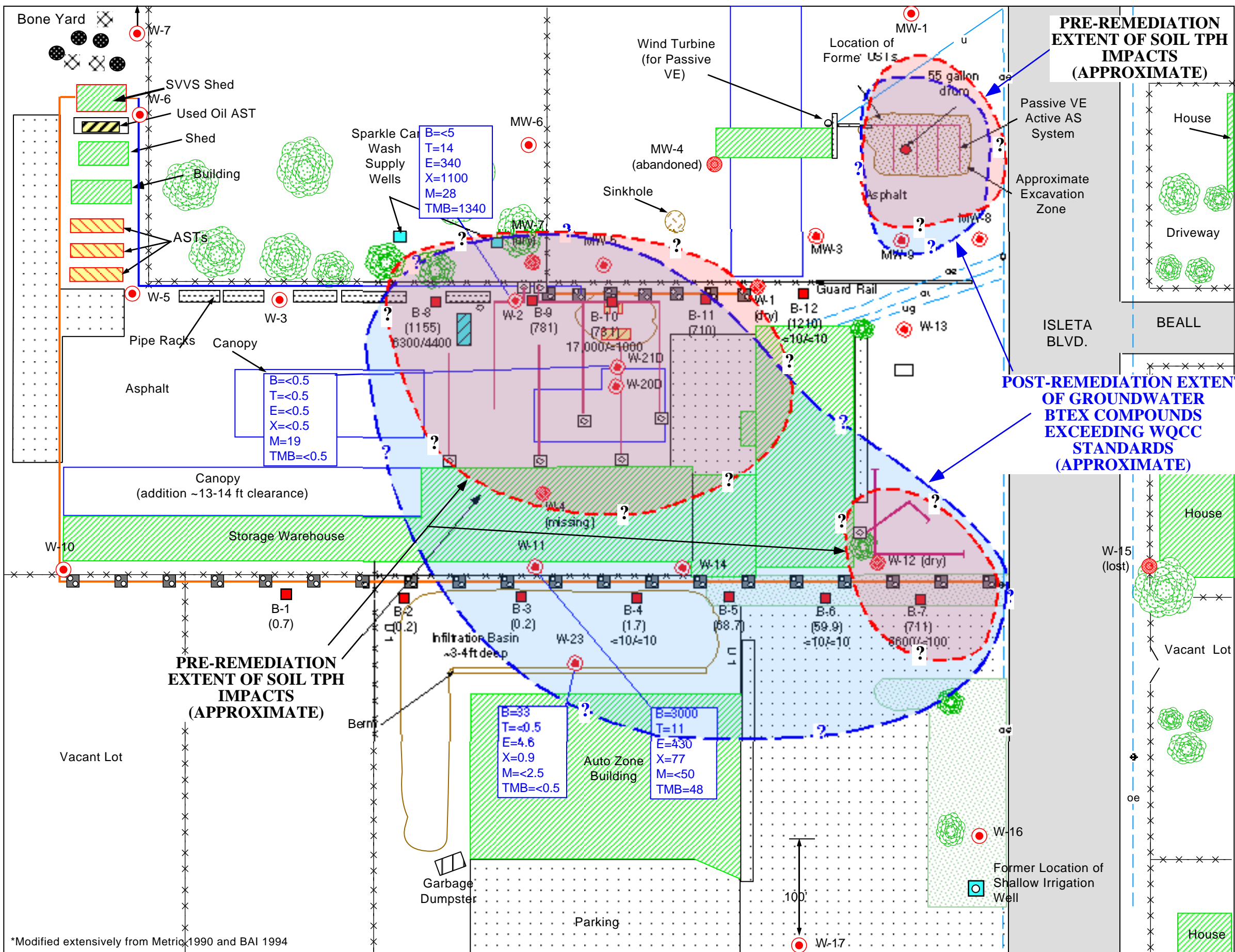
AS/VE Task Five - Conduct AS/VE Pilot Test (Optional)

As discussed above, FEI/TPA recommends the implementation of a short-term AS/VE pilot test to evaluate remedial alternatives, the effects of short-circuiting, well spacing/zone(s) of influence, process water generation vs. applied vacuum, flow and vacuum responses, and off-gas emission concentration and composition. Data collected during the pilot test will be used to aid in design of the final reclamation system.

Due to the many site complexities, the pilot test will be conducted in two primary phases over a two-day period. Phase One will consist of in-situ VE testing on several newly installed high performance 4" diameter wells (see above). In an effort to evaluate the effects of lithologic heterogeneity across the Site and short-circuiting from the previously installed reclamation systems, pilot testing will be conducted at three separate locations. Tentative test wells include VM-3 (primary test well) and VM-8 and VM-9 (ancillary test wells). Using proposed monitor wells in conjunction with strategically placed vadose/phreatic zone 1" diameter monitoring well clusters, will allow measurement of vacuum responses and sparging effectiveness in a three dimensional nature during each portion of the pilot test. It should be noted that the use of pre-existing wells to measure vacuum responses is likely to provide erroneous data as many of these wells were installed as drive-point wells and lack bentonite seals. Phase Two will consist of combined in-situ AS/VE at well locations VM-3 and AS-1.

Phase One will be run for approximately 8 hours; starting with wells VM-8 and VM-9 for approximately two hours each followed by four hours of applied VE at well VM-3. Phase Two will be implemented the following day and consist of operation of VM-3 and initiation of sparging into AS-1 for an approximate 10 hour period. During the Phase Two portion of the test, a tracer gas (helium or sulfur hexafluoride) will be injected into the sparge well at a known concentration. Samples will be collected from the VE well using a field detector to evaluate flow and travel time characteristics at the Site.

During the Phase One and Two portions of the test, six vapor samples will be collected in tedlar bags and sent to the laboratory for TPH and BTEX analysis using EPA Method 8015 modified and 8021. In addition, three samples will also be analyzed for fixed gases and methane using standard EPA methodology.



EXPLANATION:

MW-3 Existing Monitor Well Location

B=Benzene
T=Toluene
E=Ethyl Benzene
X=Total Xylenes
M=(MTBE) Methyl-Tertiary Butyl Ether
TMB=trimethyl benzenes
Laboratory Groundwater Analysis (dbs 1998). All Concentrations in Parts Per Billion (ppb).

Soil Boring Location (BAI, 1994)

B-7 (711) PID Reading (in ppm/v)

6600/100 TPH as gasoline/diesel

Below Ground SVVS Remediation System Piping

Above Ground SVVS Remediation System Piping

Passive Below Ground Vadose Zone Remediation System

SVVS Remediation Well Nest (Location Approximate)

Building

Concrete

Utility Pole

Fence Line

Trees/vegetation

Underground/overhead Utility

Proposed Soil Boring

Proposed Air Sparging Well

Proposed Dual Completion Pilot Test Well

Proposed 4" Dia. Ve/monitor Well

Proposed 2" Dia. Monitor Well

0 40 ft
Scale

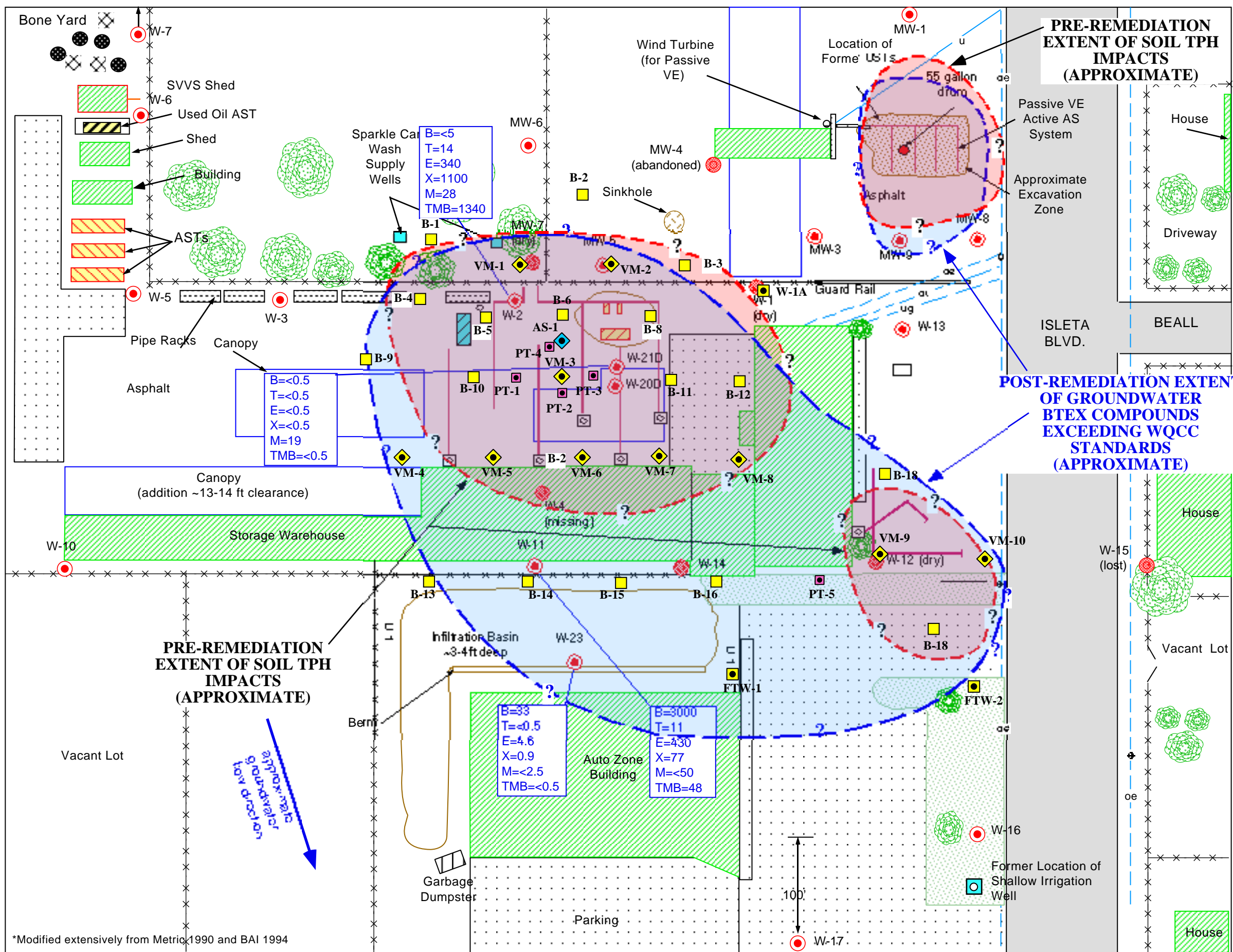
Soil and Groundwater Quality Summary Map
Rodger's Drilling Site
2615 Isleta Blvd. SW
Albuquerque, New Mexico

FEI FAITH ENGINEERING, INC.

TECUMSEH PROFESSIONAL ASSOCIATES, INC.

Drawn by: WJB/CAF*	7/99	Client: BCEHD
Drafted by: ABL	7/99	Job # 035-001
Reviewed by: WJB	7/99	Figure: 5A

*Modified extensively from Metric 1990 and BAI 1994



EXPLANATION:

MW-3 Existing Monitor Well Location

B=Benzene
T=Toluene
E=Ethyl Benzene
X=Total Xylenes
M=(MTBE) Methyl-Tertiary Butyl Ether
TMB=trimethyl benzenes
Laboratory Groundwater Analysis (dbs 1998). All Concentrations In Parts Per Billion (ppb).

Soil Boring Location (BAI, 1994)

B-7 (711) PID Reading (in ppm/v)

6600/<100 TPH as gasoline/diesel

Below Ground SVVS Remediation System Piping

Above Ground SVVS Remediation System Piping

Passive Below Ground Vadose Zone Remediation System

SVVS Remediation Well Nest (Location Approximate)

Building

Concrete

Utility Pole

Fence Line

Trees/vegetation

Underground/overhead Utility

Proposed Soil Boring

Proposed Air Sparging Well

Proposed Dual Completion Pilot Test Well

Proposed 4" Diameter Ve/monitor Well

Proposed 2" Diameter Monitor Well

0 40 ft
Scale

Proposed Drilling and Pilot Test Locations
Rodger's Drilling Site
2615 Isleta Blvd. SW
Albuquerque, New Mexico

FEI FAITH ENGINEERING, INC.		TECUMSEH PROFESSIONAL ASSOCIATES, INC.	
Drawn by: WJB/CAF*	7/99	Client: BCEHD	
Drafted by: ABL	7/99	Job #: 035-001	
Reviewed by: WJB/SF	7/99	Figure: 5B	

*Modified extensively from Metric 1990 and BAI 1994

12/1/95•BJWR	0	NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — SUMMARY SHEET	
Site Name: Rodger's Drilling		Site Address: 2615 Isleta SW Albuquerque, NM 87105	
Circle only one:	Circle only one:	Phase 2 — Free Product / Saturated Soil Recovery	Phase 4 — Reclamation Implementation
<input type="checkbox"/> Work plan	<input type="checkbox"/> Claim	<input type="checkbox"/> Phase 1 — Hydrogeo Investigation	<input type="checkbox"/> Phase 3 — Reclamation Proposal
		<input type="checkbox"/> Phase 5 — Operations and Maintenance	
FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5		NMED Use Only	
SUMMARY SHEET	TOTAL	Project Manager	Auditor
PROFESSIONAL SERVICES	\$39,430.00		
TAXABLE EXPENSES	\$6,663.00		
TAXABLE SUBCONTRACTORS	\$31,116.75		
TAXABLE SUBTOTAL	\$77,209.75		
NMGRT RATE 5.5625% X TAXABLE SUBTOTAL =	\$4,294.79		
TOTAL	\$81,504.54		
NONTAXABLE EXPENSES			
NONTAXABLE SUBCONTRACTORS			
NONTAXABLE SUBTOTAL			
GRAND TOTAL OF CLAIM	\$81,504.54		

12/1/95•BJWR

NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — PROFESSIONAL SERVICES

Site Name: Rodger's Drilling**Site Address:** 2615 Isleta SW
Albuquerque, NM 87105**Circle only one:**☒ **Work plan** ☐ **Claim****Circle only one:**☐ Minimum Site Assessment☒ Phase 1 — Hydrogeo Investigation☐ Phase 2 — Free Product /
Saturated Soil Recovery☐ Phase 3 — Reclamation Proposal☐ Phase 4 — Reclamation Implementation☐ Phase 5 — Operations and Maintenance

FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5

NMED Use Only

PROFESSIONAL SERVICES	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
initial sampling + 3qtrs gw monitoring					\$12,770.00		
Drilling & Sampling (Hydrogeologic Investigation)					\$11,460.00		
Hydrogeologic Report					\$10,080.00		
Pilot Testing					\$5,120.00		
Site Review							
SUBTOTAL					\$39,430.00		

NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — EXPENSES

Site Name: Rodger's Drilling

Site Address: 2615 Isleta SW
Albuquerque, NM 87105

Circle only one:

☒ Work plan ☐ Claim

Circle only one:

Minimum Site Assessment

☒ Phase 1 — Hydrogeo InvestigationPhase 2 — Free Product /
Saturated Soil Recovery

Phase 3 — Reclamation Proposal

Phase 4 — Reclamation Implementation

☐ Phase 5 — Operations and Maintenance

FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5

NMED Use Only

EXPENSES	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
NONTAXABLE							
N/A							
NONTAXABLE SUBTOTAL							
TAXABLE							
initial sampling + 3qtrs gw monitoring					\$2,537.00		
Drilling & Sampling (Hydrogeologic Investigation)					\$2,597.00		
Hydrogeologic Report					\$567.00		
Pilot Testing					\$962.00		
Site Review							
TAXABLE SUBTOTAL					\$6,663.00		

Site Address: 2615 Isleta SW
Albuquerque, NM 87105

Phase 5 — Operations and Maintenance

NMED Use Only

SUBCONTRACTORS	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
NONTAXABLE							
N/A							
NONTAXABLE SUBTOTAL							
TAXABLE							
initial sampling + 3qtrs gw monitoring					\$3,798.90		
Drilling & Sampling (Hydrogeologic Investigation)					\$23,747.85		
Hydrogeologic Report							
Pilot Testing					\$3,570.00		
Site Review							
TAXABLE SUBTOTAL					\$31,116.75		

6.0 CLIMATE ROOFING SITE - 2700 ISLETA BOULEVARD SW

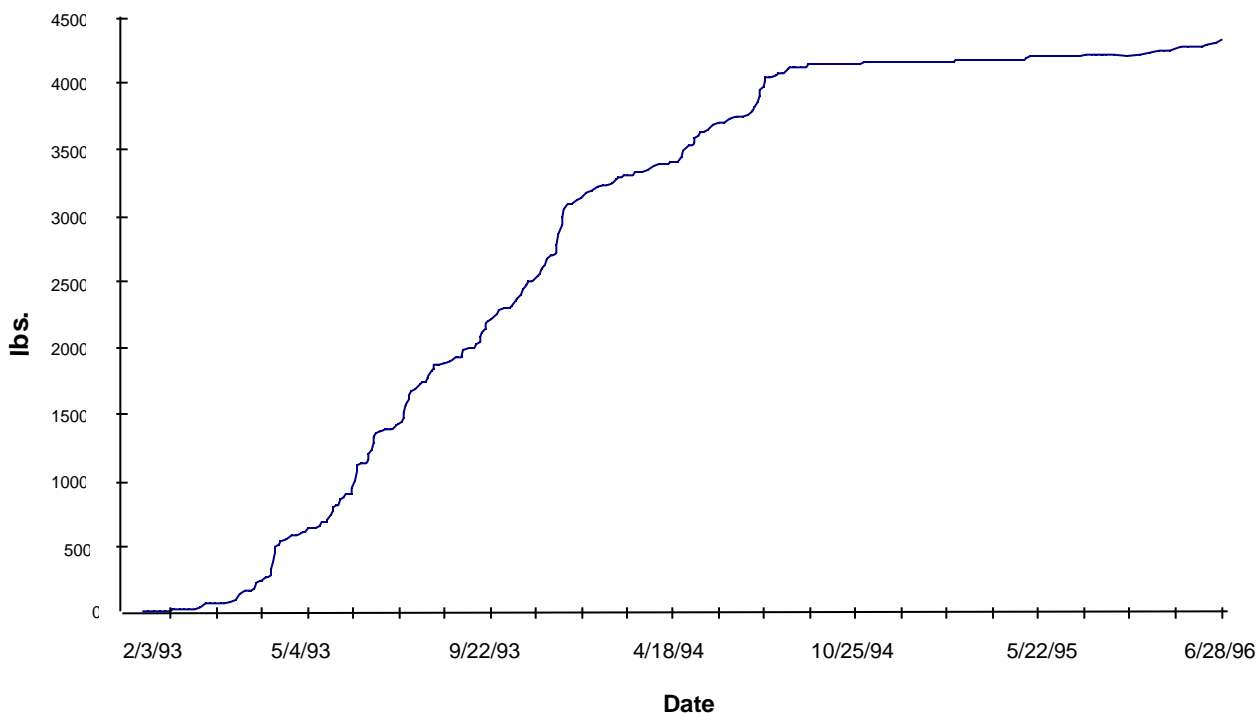
NMED Facility Number 3245001

6.1 INTRODUCTION/SITE HISTORY

Based on a comprehensive review of available historical data, past Site knowledge, and completion of a detailed site inspection, FEI/TPA completed the following Site summary. In addition, detailed maps were constructed summarizing known Site conditions and are presented as Figures 6A and 6B. This site was investigated and the remedial AS/VE system was designed, installed and operated by FEI from 1990 to 1996. The site's main office building was demolished subsequent to cessation of remedial activities.

- Hydrocarbon releases were first identified at this Site in 1990 during removal of the former USTs (see Figure 6A) under the direction of the Albuquerque Environmental Health Department. Based on limited laboratory analysis of soil samples, both gasoline and diesel fuels were released at the Climate Site.
- The Site was first investigated by FEI in October, 1990 under contract with the NMED/USTB through their cooperative agreement with the Albuquerque Environmental Health Department (AEHD). The initial site investigation included the completion of 20 boreholes from which 13 monitor wells were completed. The historic site map is shown in Figure 6A and indicates the most recent hydrocarbon plume configuration, borehole/monitor well locations, and the Air Sparge/Vapor Extraction (AS/VE) well configuration.
- Shallow ground water flow has been calculated to flow to the south-southwest at a gradient of approximately 10^{-3} ft/foot. Depth to ground water is approximately 7 to 8 feet below ground surface (bgs). Site geology is characterized as silty sand from the surface to a depth of approximately 5 feet bgs, which is underlain by well-sorted medium sand.
- Pilot testing for the installation of an AS/VE remediation system took place in July, 1992. Installation of the AS/VE system took place in December, 1992, and the system was started in January, 1993. Initial start up problems included the need to install noise abatement materials to reduce the blower/vacuum pump equipment vibrations in the wooden remediation equipment enclosure, compressor/blower heat induced failure of above ground sparge manifold headers, and other minor mechanical problems.





- The Climate AS/VE system operated until June, 1996, during which time significant ground water hydrocarbon reductions were made. The final ground water benzene concentrations from June, 1996 and those collected subsequently by NMED/USTB are shown on Figure 6A. During March, 1994, soil test borings were completed to determine the degree of TPH reductions in the soil vadose zone. Results of those determinations are also shown on Figure 6A. This soil TPH extent is representative of soil conditions after 14 months of a total 40-month operational history, and do not represent the final cleanup levels. The hydrocarbon recovery curve (shown above) from the operational history of the AS/VE system at the Climate site shows approximately 4200 lbs. (700 gal.) of hydrocarbon were recovered via physical extraction. An unknown amount was also removed via enhanced in-situ biodegradation. NMED/USTB has conducted a limited amount of ground water sampling at the site since 1996, and the results indicate that BTEX levels have increased in monitor well MW-11. It is apparent from this data that the Site has experienced some “rebound” of BTEX and an unknown amount of soil contamination is still present.
- The area to the southwest of the UST release area was formerly occupied by a home/office building that was destroyed by fire in 1997 and has since been removed. The former AS/VE system was unable to remove ground water and soil contamination under this former building. The extent of damage to the on-site, below-grade AS/VE



wells and manifolding due to demolition or other activity at the site since June, 1996 is unknown.

- Subsequent to the June, 1996 system shutdown, the Site's above ground mechanical remediation components were removed by FEI after the landowner requested their removal to allow site demolition to proceed. The equipment was stored by FEI and turned over to NMED/USTB in December, 1997.

6.2 EXISTING SITE CONDITIONS

Based on the above, the following deficiencies need to be addressed:

- The former AS/VE system at the Site was successful in lowering ground water contamination to below NMWQCC standards in all but a few monitoring wells. However, it is apparent from subsequent sampling and analysis that was conducted by the NMED/USTB that ground water BTEX concentrations are increasing and residual soil TPH levels are still elevated. Confirmation soil borings need to be advanced to evaluate current subsurface contaminant conditions.
- The former AS/VE system was unable to remove ground water and soil contamination under the former home/office building. The extent of damage to the on-site, below-grade AS/VE wells and manifolding due to demolition or other activity at the site since June, 1996 is unknown.

6.3 RECOMMENDED ACTIONS

Task One – Site Review and Work Plan Development

This task provides for the review of FEI and NMED/USTB files, site mapping and photography, review of historic ground water and soils data, and final preparation of this work plan for additional investigation.

Task Two – Sample Existing Wells and Conduct Three Additional Quarterly Sampling Rounds

Groundwater in all usable wells (ten existing wells) will be sampled during an initial event for organic parameters including BTEX, MTBE, EDC, EDB, and naphthalene using EPA Method 8260. It is believed that at least three of the existing wells, MW-6, 7 and 13 (see Figure 6A), were destroyed during building demolition. The following natural attenuation indicators will also be sampled for using field test kits: dissolved oxygen (DO), nitrate (NO₃), dissolved and total iron (Fe), alkalinity (HCO₃/CO₃), phosphate (PO₄), and sulfate (SO₄). Additional field tests will include pH, temperature, and conductivity. FEI/TPA will provide NMED/USTB and BCEHD 48-hour notification prior to initiating any sampling.

We also propose three additional quarters of groundwater sampling for BTEX, TMB, EDB, EDC and MTBE using EPA Method 8021 (EDX) and for the above natural attenuators. The additional three wells

that are proposed to be completed will also be sampled for these parameters after their completion during Task 3. We propose sampling 10 wells in the second, third and fourth quarters.

During each sampling event ground water levels will be measured prior to sampling. Collected data will be used to refine drilling locations as needed in Task Three below. New locks and well caps will be installed on each usable well. Quarterly reports will be submitted according to the requirements of USTR §1216.

Task Three – Hydrogeologic Investigation

General – FEI/TPA will characterize the magnitude and extent of residual soil and ground water contamination in the vicinity of the Climate Site through advancement and sampling of soil borings and monitor wells. Tentative drilling locations are shown in Figure 6B. For the purposes of cost estimation and based on a comprehensive review of the Site data, we propose the following number of soil borings and wells:

Projected Drilling Activity

- 10 - Soil borings
- 3 - 2” diameter shallow completion monitor wells


All soil borings will be sampled on a continuous basis using either 2-foot long split spoons or 5 foot long core barrels. PID headspace analysis will be conducted on retrieved soil samples at five-foot intervals or less and at the water table. One to two laboratory soil samples will be collected from each drilling location and analyzed for TPH (gasoline-diesel range) using EPA method 8015 modified and for BTEX and MTBE using EPA method 8021. Samples will be collected for gasoline-range compounds using methanol extraction kits and unpreserved 4-oz jars for diesel-range compounds. New ground water monitoring wells installed during this task will be sampled and analyzed for the same EPA 8260 hydrocarbon parameters, natural attenuation indicators and field tests which were described for the initial well sampling in Task 2. Additionally, all new and existing wells will be surveyed to a common USGS (or other) established Mean Sea Level benchmark datum by a NM licensed surveyor.

Aquifer Hydraulic Properties - Pursuant to the requirements of the USTR Part XII, Section 1210, FEI/TPA recommend evaluation of Site hydrogeologic properties through laboratory testing of retrieved sediment samples. Data collected from these activities will be used to determine grain size distribution, grain and bulk density, specific permeability (k) and effective porosity (n). Hydraulic properties such as storativity, transmissivity (T), and hydraulic conductivity (K) can then be estimated using sediment sample data. This information will then be used to calculate average ground water and contaminant migration rates, which are necessary in risk assessment calculations and/or determination of potential remedial alternatives. We recommend the three monitor well locations to collect discrete sediment samples for laboratory characterization. Two samples will be collected from each location; one in the vadose zone and one in the shallow saturated zone. In addition to the above, two of the samples will also be analyzed for total organic carbon content (TOC).

Task Four - Completion of the Hydrogeologic Investigation (HI) Report











Upon receipt of all field data, FEI/TPA will prepare a summary HI report. This Report will include geologic and contaminant distribution cross sections, isoconcentration maps, a ground water isocontour map, appropriate tables, and text summarizing the results of the investigation as it relates to plume characterization and site remediation, and the requirements of the USTR. In addition, residual hydrocarbon spill mass estimates will be included.

Historic Site Map
Climate Roofing Site
2700 Isleta Blvd. SW
Albuquerque, New Mexico

FEI FAITH ENGINEERING, INC. 
TECUMSEH
PROFESSIONAL ASSOCIATES, INC.

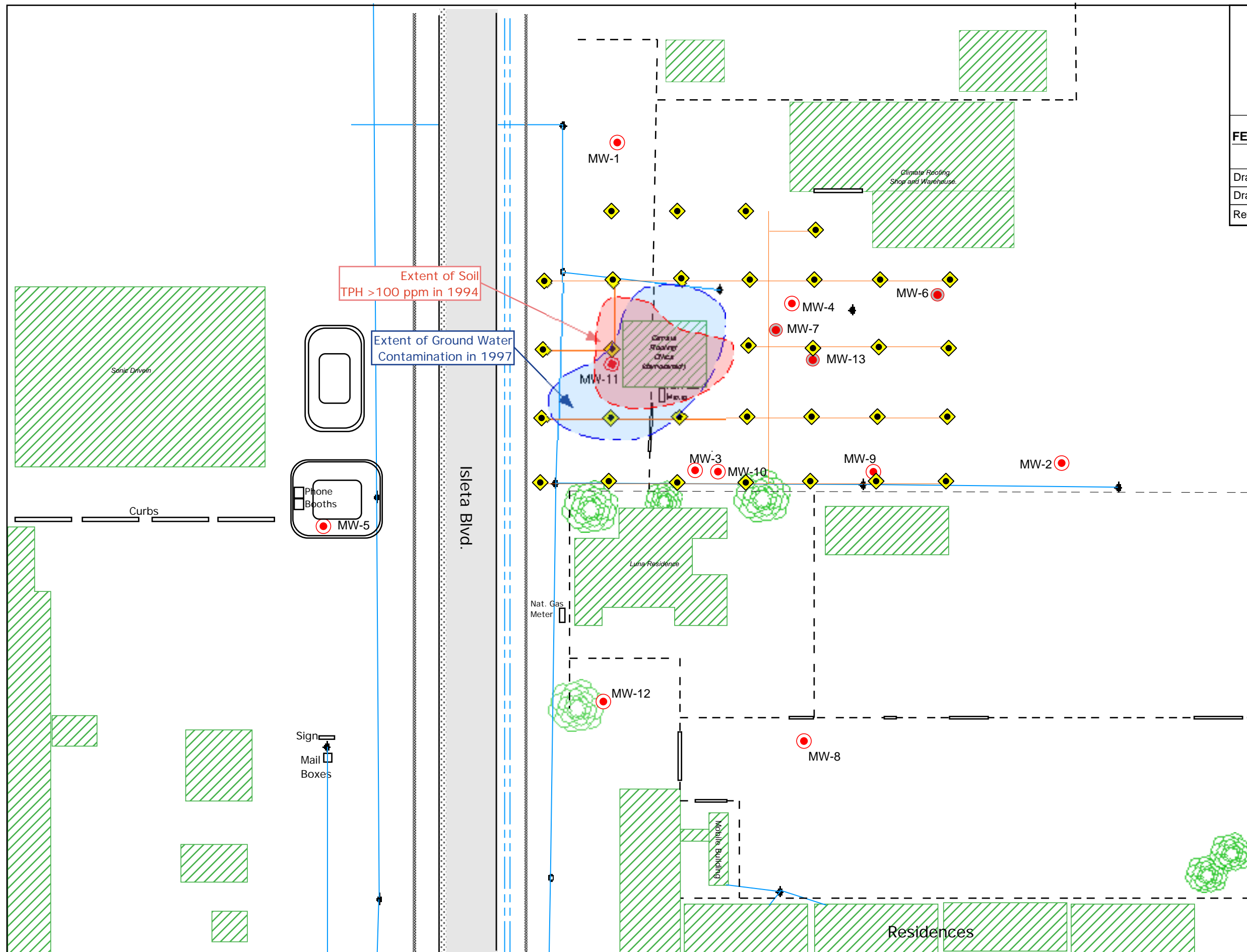
Drawn by: WJB/CAF*	7/99	Client: BCEHD
Drafted by: SEF/CF	7/99	Project: 99-99-1190
Reviewed by: WJB/CF	7/99	Figure: 6A

LEGEND


-  Existing Monitor Well Location
-  Monitor Well Lost or Destroyed
-  Below Ground Sparge/vent Remediation System Piping
-  Utility Pole
-  Building
-  Concrete
-  Gate In Fence
-  Fence Line
-  Trees/vegetation
-  Underground/overhead Utility



0 40 ft
Scale



Proposed Borehole and Monitor Well Locations
Climate Roofing Site
2700 Isleta Blvd. SW
Albuquerque, New Mexico

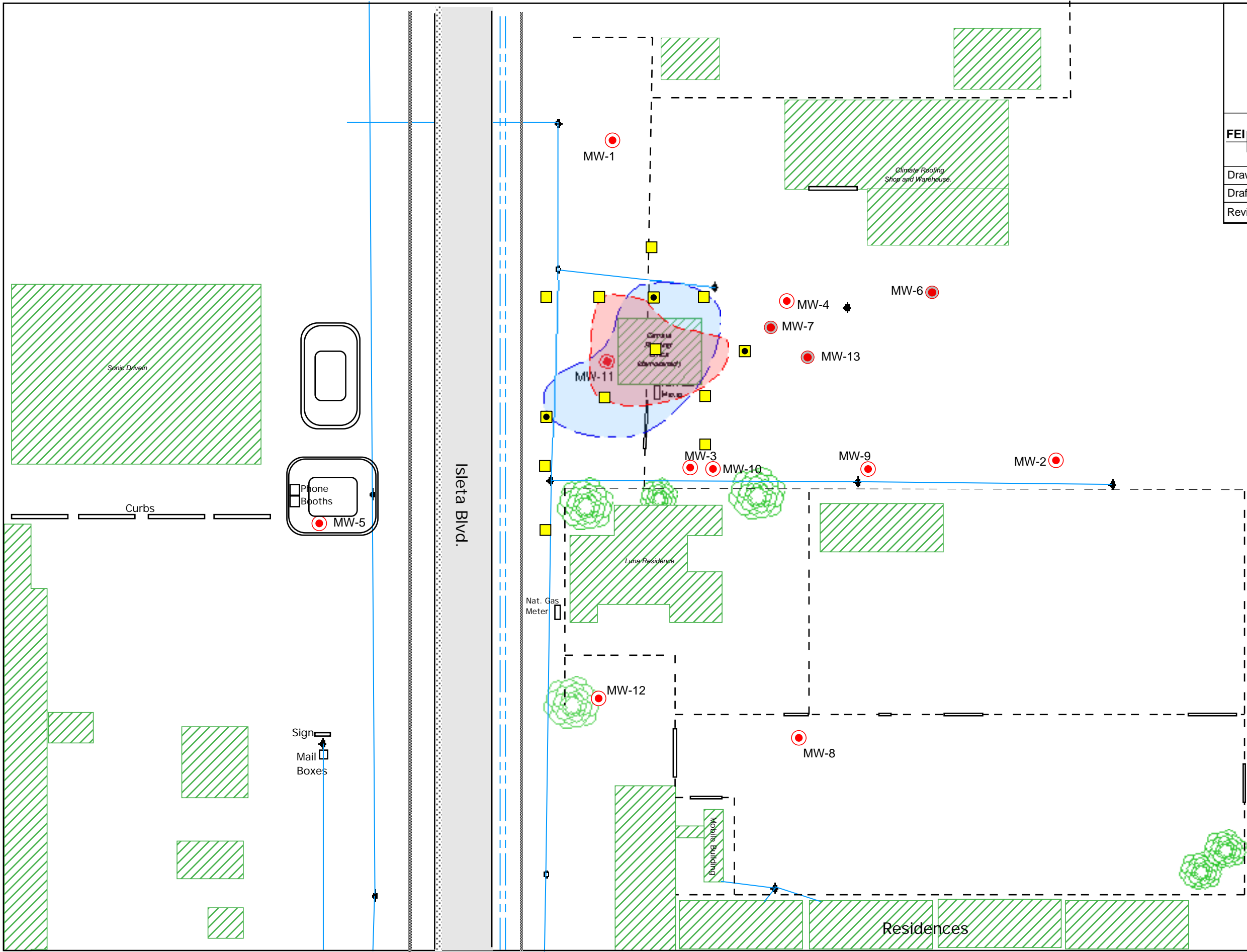
FEI FAITH ENGINEERING, INC.		
		TECUMSEH PROFESSIONAL ASSOCIATES, INC.
Drawn by: WJB/CAF*	7/99	Client: BCEHD
Drafted by: SEF/CF	7/99	Project: 99-99-1190
Reviewed by: WJB/CF	7/99	FIGURE: 6B

LEGEND

- Existing Monitor Well Location
- Monitor Well Lost or Destroyed
- Below Ground Sparge/vent Remediation System Piping
- Utility Pole
- Building
- Concrete
- Gate In Fence
- Fence Line
- Trees/vegetation
- Underground/overhead Utility

- Proposed Soil Borng
- 2" Dia.air Sparging Well
- Proposed Dual Completion Pilot Test Well
- 2" Dia. Vapor Extraction Well
- Proposed 2" Dia. Monitor Well

0 40 ft
Scale



12/1/95•BJWR	0	NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — SUMMARY SHEET	
Site Name: Climate Roofing		Site Address: 2700 Isleta SW Albuquerque, NM 87105	
Circle only one:	Circle only one:	Phase 2 — Free Product / Saturated Soil Recovery	Phase 4 — Reclamation Implementation
<input type="checkbox"/> Work plan	<input type="checkbox"/> Claim	<input type="checkbox"/> Phase 1 — Hydrogeo Investigation	<input type="checkbox"/> Phase 3 — Reclamation Proposal
		<input type="checkbox"/> Phase 5 — Operations and Maintenance	
FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5		NMED Use Only	
SUMMARY SHEET	TOTAL	Project Manager	Auditor
PROFESSIONAL SERVICES	\$26,980.00		
TAXABLE EXPENSES	\$3,456.25		
TAXABLE SUBCONTRACTORS	\$10,990.35		
TAXABLE SUBTOTAL	\$41,426.60		
NMGRT RATE 5.5625% X TAXABLE SUBTOTAL =	\$2,304.35		
TOTAL	\$43,730.95		
NONTAXABLE EXPENSES			
NONTAXABLE SUBCONTRACTORS			
NONTAXABLE SUBTOTAL			
GRAND TOTAL OF CLAIM	\$43,730.95		

NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — PROFESSIONAL SERVICES

Site Name: Climate Roofing**Site Address:** 2700 Isleta SW
Albuquerque, NM 87105**Circle only one:****Work plan** **Claim****Circle only one:**

Minimum Site Assessment

Phase 1 — Hydrogeo InvestigationPhase 2 — Free Product /
Saturated Soil Recovery

Phase 3 — Reclamation Proposal

Phase 4 — Reclamation Implementation

Phase 5 — Operations and Maintenance

FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5

NMED Use Only

PROFESSIONAL SERVICES	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
Initial Sampling +3 qtrs gw monitoring					\$9,980.00		
Drilling & Sampling (Hydrogeologic Investigation)					\$5,840.00		
Hydrogeologic Report					\$11,160.00		
SUBTOTAL					\$26,980.00		

12/1/95•BJWR		NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — EXPENSES					
Site Name: Climate Roofing		Site Address: 2700 Isleta SW Albuquerque, NM 87105					
Circle only one: <div style="border: 1px solid black; display: inline-block; padding: 2px;">Work plan</div> <i>Claim</i>		Circle only one: Minimum Site Assessment Phase 2 — Free Product / Saturated Soil Recovery <div style="border: 1px solid black; display: inline-block; padding: 2px;">Phase 1 — Hydrogeo Investigation</div> Phase 3 — Reclamation Proposal Phase 4 — Reclamation Implementation <div style="border: 1px solid black; display: inline-block; padding: 2px;">Phase 5 — Operations and Maintenance</div>					
FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5						NMED Use Only	
EXPENSES	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
NONTAXABLE							
N/A							
NONTAXABLE SUBTOTAL							
TAXABLE							
Initial Sampling +3 qtrs gw monitoring					\$2,121.00		
Drilling & Sampling (Hydrogeologic Investigation					\$1,270.50		
Hydrogeologic Report					\$64.75		
TAXABLE SUBTOTAL					\$3,456.25		

Site Address: 2700 Isleta SW
Albuquerque, NM 87105

Phase 5 — Operations and Maintenance

NMED Use Only

SUBCONTRACTORS	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
NONTAXABLE							
N/A							
NONTAXABLE SUBTOTAL							
TAXABLE							
Initial Sampling +3 qtrs gw monitoring					\$2,898.00		
Drilling & Sampling (Hydrogeologic Investigation					\$8,092.35		
Hydrogeologic Report							
TAXABLE SUBTOTAL					\$10,990.35		

7.0 LEE & BLAKELY SITE - 3031 ISLETA BOULEVARD SW NMED Facility Number 11475001

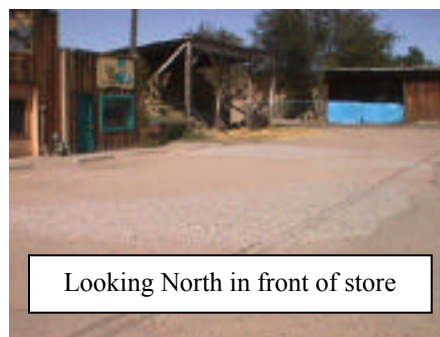
7.1 INTRODUCTION/SITE HISTORY

Based on a comprehensive review of available historical data, past Site knowledge, and completion of a detailed site inspection, FEI/TPA completed the following Site summary. In addition, a detailed map was constructed summarizing known Site conditions and is presented in Figure 7A.

- The Lee and Blakely Site (now Brown's Discount Feed) was initially investigated by the Bernalillo County Environmental Health Department (BCEHD) during the early phases of their Technology Deployment Initiative (TDI). Four former gasoline USTs were excavated and removed from the site in March, 1998 after their location had been determined utilizing ground penetrating radar and magnetometer surveys. During UST removal activities, two 1,000-gallon gasoline tanks and two 750-gallon tanks were found, which are believed to have been leaded gasoline tanks. It was also reported that a former diesel UST was removed from the site prior to 1985. Approximately 403 tons of contaminated soil and 250 gallons of a product/ground water mix were removed during tank excavation and disposed of off-site. During the UST excavation, a backhoe trench near the former diesel UST area was completed and was found to be hydrocarbon stained, and subsequent TPH levels were 4300 mg/kg.
- 
- Looking South in front of store
- Subsequent investigation by FEI has shown that soil and ground water contamination is still present at the Site and will require additional remediation. Figure 7A provides the approximate extent of soil and ground water contamination at the Site. Additional details regarding these recent investigations are available in *Site Investigation Report, Lee & Blakely Feedstore, 3031 Isleta Blvd. SW*, FEI, September, 1999.
 - During FEI's Investigation, a total of 19 soil borings and 8 monitor wells were advanced at the Site to depths of between 8 and 16 feet below ground surface (bgs) at the locations shown on Figure 7A. Hollow-stem auger (HSA) drilling techniques were used. Site geology, as observed in retrieved split-spoon samples and soil cuttings, can generally be classified as near surface (< 3 to 4 ft. bgs) silty sands with localized, discontinuous silty or clay units, which grade to medium to coarse grained sands with depth. The sand zone along the air-water interface contains the majority of the adsorbed residual petroleum hydrocarbons.
 - During the Investigation, water saturated conditions were generally first encountered in boreholes and monitor wells at depths ranging between approximately 5.5 to 6.5 feet. Depth to ground water

measurements collected from the monitor wells in February, June, and September 1999 indicate that the potentiometric water surface slopes to the south-southwest at a gradient of approximately 0.0013 feet/foot. Based on grain size distributions of selected soil samples the hydraulic conductivity (K) of the upper portion of the saturated zone is approximately 1000 to 1500 gpd/ft.

- Nineteen (19) soil borings were advanced at the Site between February and May, 1999 using a CME-55 hollow-stem auger (HSA) drill rig supplied and operated by Rodgers Drilling, Inc. Eight (8) of the borings were completed as monitor wells MW-1, MW-1D, MW-2, MW-3, MW-4, MW-5, MW-6 and MW-7. The remaining soil borings were backfilled with activated bentonite and bentonite-cement grout following completion.
- During drilling activities, retrieved sediment samples were collected from the boreholes and analyzed in the field for Total Ionizable Volatile Compounds (TIVC) using either a Thermo-Environmental Instruments Model 580-B PID or a RAE-2000 PID, both of which utilize a 10.6 eV lamp. At each drilling location one or more sediment samples were also collected using the USTR Methanol Extraction Method for gasoline-range hydrocarbons and standard methods for diesel and oil-range hydrocarbons and sent to Pinnacle Laboratories, Inc. for analyses. Laboratory samples were analyzed for Total Petroleum Hydrocarbons (C₆-C₃₆ carbon range) using EPA Method 8015 (modified) and BTEX and MTBE using EPA Method 8021 (modified).
- Select samples were also collected for analysis of Total Organic Carbon (TOC), grain size, percent moisture, clay content/plasticity, and heterotrophic bacterial population counts.
- On February 22, 1999 and June 10, 1999, FEI sampled ground water monitor wells at the Site. Prior to ground water sampling, depth to water was measured in each well with an electronic water level meter accurate to +/- 0.01 feet. Each well was then developed and purged by removing greater than or equal to three well volumes of water using a Grundfos sampling pump. Ground water samples collected by FEI were analyzed for BTEX, MTBE, EDC, and TMBs using EPA Method 8260, for EDB using EPA Method 504.1, and for naphthalenes by EPA Method 8310.
- Examination of laboratory and field sampling data indicate the residual contamination exists primarily as sorbed phase TPH (primarily in the C₆ to C₁₀ hydrocarbon range – weathered gasoline) in medium sand layer lying at a depth of approximately 5 to 8 feet bgs.
- Ground water sampling data indicate the presence of a benzene dominated dissolved-phase ground water hydrocarbon plume emanating from the vicinity of the former Lee and Blakely USTs. The



extent of off-site ground water contaminant migration appears to be of limited extent, although it does appear to extend south of the Site. (Figure 7A)

- The analyses of soil and ground water samples indicate that the primary contaminant is gasoline. The modest levels of BTEX components found in the ground water in comparison to the residual TPH found in the overlying soils suggests that at least portions of the hydrocarbon releases are old. However, the presence of a benzene dominated dissolved-phase BTEX plume in the southern portion of the Site argues for a more recent, less weathered hydrocarbon release at the Site.
- Although some residual contamination is apparent under the existing retail business buildings and under the Isleta Blvd. right-of-way, the majority of the contaminant mass appears to exist under the parking area between the buildings and the right-of-way.
- Residual spill mass estimates indicate that approximately 6,000 pounds of hydrocarbons are present in the Lee & Blakely plume primarily in the form of adsorbed-phase soil contamination.

7.2 EXISTING SITE CONDITIONS

This site has been characterized and reported. Remedial alternatives have been recommended. Selection of site cleanup has been delayed until final roadway upgrade plans and acquisition/condemnation issues have been resolved. FEI/TPA have prepared this work plan to provide continued quarterly ground water monitoring until the final remedial alternatives are selected and approved.

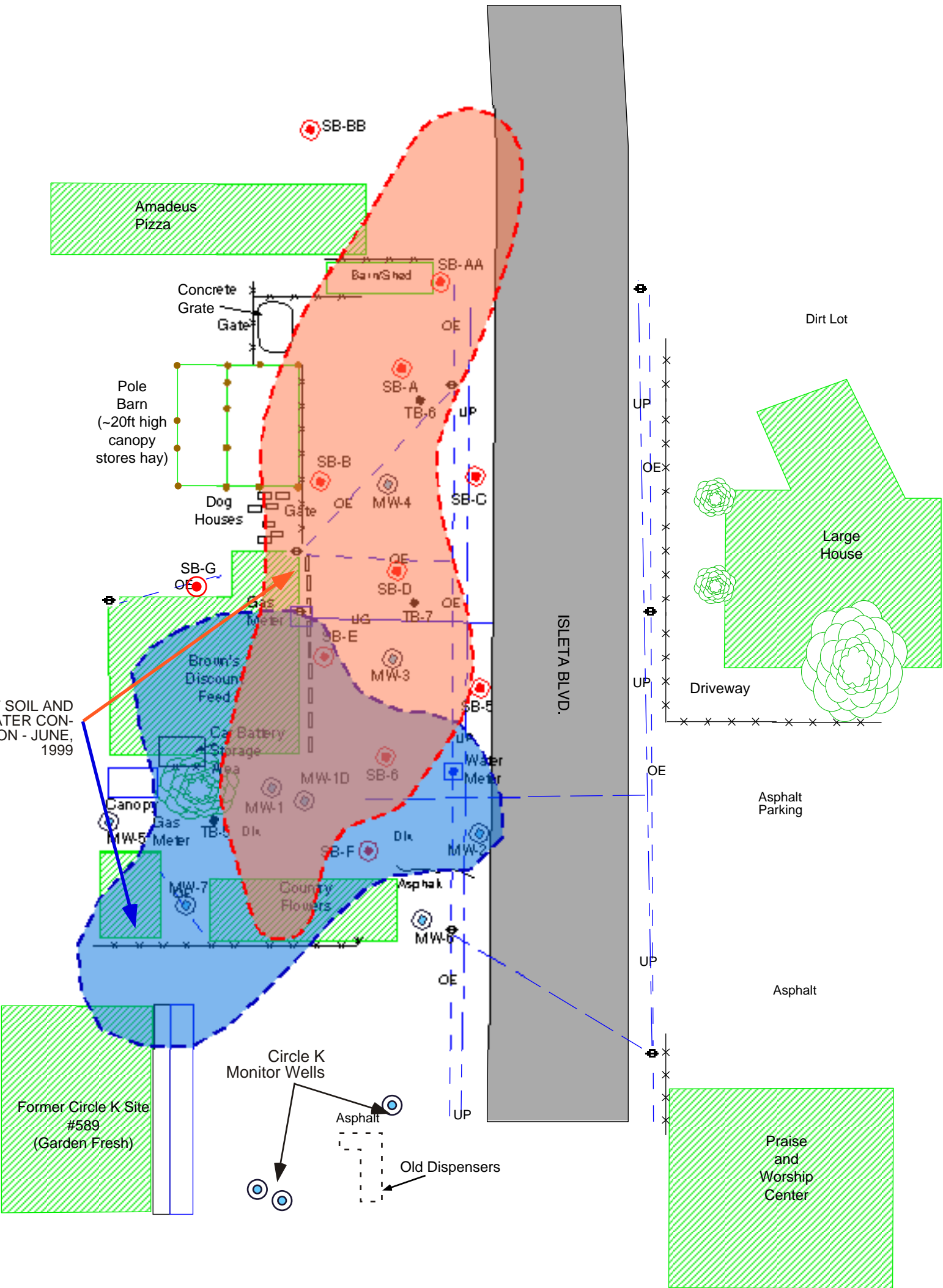
7.3 RECOMMENDED ACTIONS

Task One – Site Review and Work Plan Development

This task provides for the review of FEI and NMED/USTB files, site mapping and photography, review of historic ground water and soils data, and final preparation of this work plan for additional investigation.

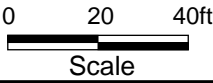
Task Two – One Year of Quarterly Ground Water Monitoring

All existing monitoring wells will be inventoried and their condition for additional ground water sampling will be determined. FEI proposes to initially sample the 8 existing monitoring wells for volatile organics by EPA Method 8260. The following natural attenuation indicators will also be sampled for using field test kits: dissolved oxygen (DO), nitrate (NO₃), dissolved and total iron (Fe), alkalinity (HCO₃/CO₃), phosphate (PO₄), and sulfate (SO₄). Additional field tests will include pH, temperature, and conductivity. FEI/TPA will provide NMED/USTB and BCEHD 48-hour notification prior to initiating any sampling. These same 8 wells will be sampled on a quarterly basis after the initial sampling for one year. Wells will be analyzed by EPA Method 8021 (EDX) and the above described natural attenuation indicators. All sampling will be preceded by water level measurements and well purging. Quarterly reports will be submitted according to the requirements of USTR §1216.



- UTILITIES
- OE Overhead Electric
 - UP Underground Phone
 - US Underground Sewer
 - UG Underground Gas

- EXPLANATION:
- Soil Boring
 - Monitor Well
 - Building
 - Concrete
 - Fence
 - Tree
 - Utility Pole



LEE & BLAKELY DISCOUNT
FEED STORE
3031 Isleta SW, Albuquerque, New Mexico

FIGURE 7A
HISTORIC SITE MAP

FEI FAITH ENGINEERING, INC.

TECUMSEH
PROFESSIONAL ASSOCIATES, INC.

12/1/95•BJWR	0	NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — SUMMARY SHEET	
Site Name: Lee & Blakely Feed		Site Address: 3031 Isleta SW Albuquerque, NM 87105	
Circle only one:	Circle only one:	Phase 2 — Free Product / Saturated Soil Recovery	Phase 4 — Reclamation Implementation
<input type="checkbox"/> Work plan	<input type="checkbox"/> Claim	<input type="checkbox"/> Phase 1 — Hydrogeo Investigation	<input type="checkbox"/> Phase 3 — Reclamation Proposal
		<input type="checkbox"/> Phase 5 — Operations and Maintenance	
FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5		NMED Use Only	
SUMMARY SHEET	TOTAL	Project Manager	Auditor
PROFESSIONAL SERVICES	\$9,200.00		
TAXABLE EXPENSES	\$1,983.75		
TAXABLE SUBCONTRACTORS	\$2,318.40		
TAXABLE SUBTOTAL	\$13,502.15		
NMGRT RATE 5.5625% X TAXABLE SUBTOTAL =	\$751.06		
TOTAL	\$14,253.21		
NONTAXABLE EXPENSES			
NONTAXABLE SUBCONTRACTORS			
NONTAXABLE SUBTOTAL			
GRAND TOTAL OF CLAIM	\$14,253.21		

NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — PROFESSIONAL SERVICES

Site Name: Lee & Blakely Feed**Site Address:** 3031 Isleta SW
Albuquerque, NM 87105**Circle only one:**☒ **Work plan** ☐ **Claim****Circle only one:**☐ Minimum Site Assessment☒ Phase 1 — Hydrogeo Investigation☐ Phase 2 — Free Product /
Saturated Soil Recovery☐ Phase 3 — Reclamation Proposal☐ Phase 4 — Reclamation Implementation☐ Phase 5 — Operations and Maintenance

FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5

NMED Use Only

PROFESSIONAL SERVICES	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
initial sampling + 3 qtrs gw monitoring					\$9,200.00		
SUBTOTAL					\$9,200.00		

NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — EXPENSES

Site Name: Lee & Blakely Feed

Site Address: 3031 Isleta SW
Albuquerque, NM 87105

Circle only one:

☒ **Work plan** ☐ **Claim**

Circle only one:

☐ Minimum Site Assessment☒ Phase 1 — Hydrogeo Investigation☐ Phase 2 — Free Product /
Saturated Soil Recovery☐ Phase 3 — Reclamation Proposal☐ Phase 4 — Reclamation Implementation☐ Phase 5 — Operations and Maintenance

FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5

NMED Use Only

EXPENSES	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
NONTAXABLE							
N/A							
NONTAXABLE SUBTOTAL							
TAXABLE							
initial sampling + 3 qtrs gw monitoring					\$1,983.75		
TAXABLE SUBTOTAL					\$1,983.75		

Site Address: 3031 Isleta SW
Albuquerque, NM 87105

Phase 5 — Operations and Maintenance

NMED Use Only

SUBCONTRACTORS	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
NONTAXABLE							
N/A							
NONTAXABLE SUBTOTAL							
TAXABLE							
initial sampling + 3 qtrs gw monitoring					\$2,318.40		
TAXABLE SUBTOTAL					\$2,318.40		

8.0 ATEX #213 SITE – 3501 ISLETA BOULEVARD, SW

NMED Facility Number 18774007

8.1 INTRODUCTION/SITE HISTORY

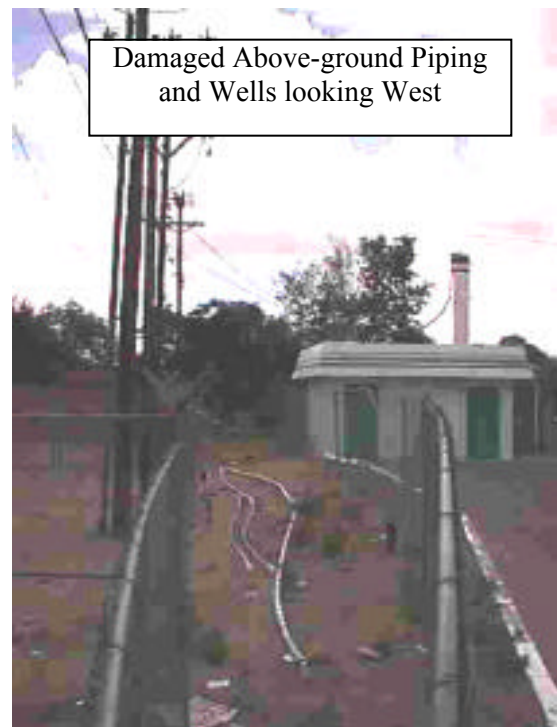
The Atex #213 Site, located at 3501 Isleta Boulevard SW, is one of the oldest documented leaking UST sites in New Mexico. Based on a comprehensive review of available historical data, past Site knowledge, and completion of a detailed site inspection, FEI/TPA completed the following site summary. In addition, detailed maps were constructed summarizing known Site conditions (Figures 8A and 8B).

- Hydrocarbon releases were first identified at the Site in 1981. Vapor impacts were documented in the small house located immediately to the west of the station (Figure 8A). Analysis of cumulative inventory records documented a shortfall of over 41,000 gallons of gasoline fuel. A second release was documented in the early 1990's when high levels of MTBE were first detected in on- and off-site monitor wells.
- Shallow ground water flow has been calculated to flow south-southeast at a gradient of approximately 10^{-3} to 10^{-4} ft/foot. Depth to ground water is approximately 9 to 11 feet below ground surface (bgs). Site geology is poorly characterized, however, it appears to be primarily a coarsening downward sequence consisting of silts and clays grading to sands and gravelly sands at and above the water table.
- The Pajarito Lateral, an unlined irrigation canal, is located immediately to the south of the Site. Although the lateral appears to effect ground water flow locally, cumulative ground water quality data indicate it has not acted as a barrier to downgradient plume migration.
- No known water supply impacts have been documented as a result of hydrocarbon releases from the Atex #213 site. Vapor impacts have been documented in US West Utility Corridors in the Site vicinity.

Atex #213 Station Looking West

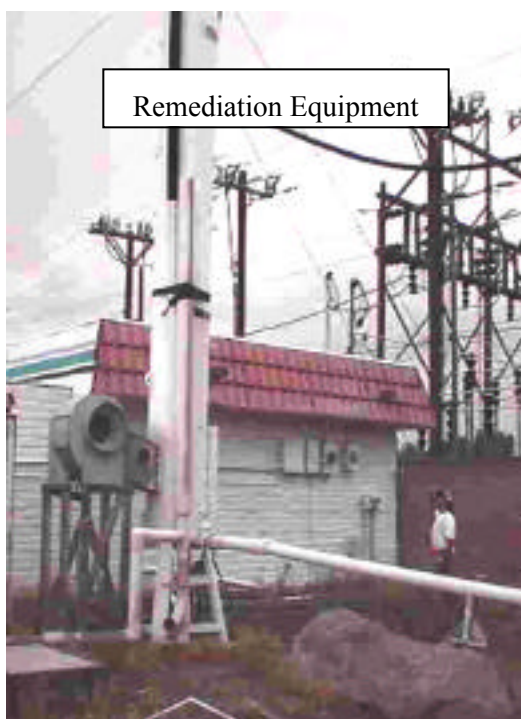


- The former South Valley Chevron leaking UST site is located approximately 800 feet to the north. The former Pollo Mexicano leaking UST site is located approximately 600 feet to the south of the Site. Long-term ground water quality data indicate neither of these plumes appears to have impacted or co-mingled with the Atex plume.
- Investigation and remediation activities have been conducted in three primary episodes at the Site. Initially, in the late 1980's, Atex retained Billings and Associates, Inc. (BAI) to conduct investigation and remediation activities at the Site. During this period, over 50 monitor wells were installed in the Site vicinity documenting a roughly circular shaped PSH and dissolved-phase ground water plume centered just west of the current dispenser islands. Soil lithology and contaminant distribution in the soil source area were not well defined during this investigation as the majority of monitor wells installed at the Site appear to have been drive point wells. High levels of BTEX compounds characterized the plume.
- In 1988, BAI installed and operated a ground water pump and treat system at the Site consisting of four recovery wells located along the north side of the power station (Figure 8A). Eight injection wells were reportedly located along the Pajarito lateral west of the power station. A site inspection by FEI/TPA personnel in July, 1999 identified the remains of four recovery wells but failed to locate the injection wells. In general, based on available data, the pump and treat system was ineffective and experienced significant problems related to biofouling of the ground water recovery and injection wells. Operation of this system reportedly ceased in early 1989.
- In April of 1989 BAI installed a series of AS/VE well nests in the former tank area located between monitor wells MW-1 and MW-3 (Figure 8A). This system was expanded several months later to include additional well nests south of the power station. These wells were operated into the early 1990's; first by BAI and later by US Tank Management, Inc. (USTM). Initially, decreases in ground-water BTEX concentrations were observed. However, in late 1990, dissolved-phase BTEX concentrations began increasing and high levels of MTBE were documented at the Site for the first time. In 1991, at the Albuquerque Environmental Health Department's (AEHD) request, Atex's new consultant, USTM, installed several new soil borings and monitor wells in the Site Vicinity. Phase Separated Hydrocarbon (PSH) was identified in two of the new on-site wells and high levels of benzene and MTBE were documented in ground water extending south of the Site past Long John Silvers (Figure



8A). The new release was reportedly from piping below the fuel dispensers. USTM apparently expanded the original AS/VE system to include additional treatment well nests immediately to the north of the power station and limited PSH recovery. Active remedial work at the Site stopped in 1992 during the Atex bankruptcy proceedings.

- Sparge and vent wells were manifolded via above-grade 1" and 2" diameter schedule 40 PVC piping to a shed housing several small Vapor Extraction (VE) and Air Sparge (AS) blowers (Figure 8A/Photograph). Examination of the above ground piping indicates it is currently in very poor condition and unusable. The condition of the blowers could not be ascertained as the storage buildings originally housing the blowers were locked. It should also be noted that many of the original monitor and AS/VE wells installed at the Site have been damaged, destroyed, or are lost.



- FEI/TPA's review of NMED files identified two post remediation ground water sampling events; one in 1994 by BAI and one in 1998 by the NMED which documented continued high levels of dissolved phase BTEX and MTBE and localized PSH in the vicinity of the fuel dispensers (Figure 8A).

8.2 EXISTING SITE CONDITIONS

Based on the above data, the following deficiencies need to be addressed:

- Site lithology and the magnitude and extent of soil and ground water hydrocarbon contamination have never been fully characterized at the Site. New release(s) and partial remediation at select locations have likely complicated the pattern of contamination at the Site. Many of the original monitor wells are destroyed and/or unusable. Although numerous wells were installed in the late 1980's and early 1990's, very little usable lithologic data is available. TPH soil samples have not been collected from the Site.
- The original pump and treat and AS/VE remediation systems are damaged beyond repair and unusable.
- Vacuum short-circuiting in the subsurface is likely to be a problem for future remedial activities unless the existing reclamation systems are properly plugged and abandoned.

- The hydrocarbon source areas have not been fully remediated. MTBE appears to be migrating off-site.
- The site needs general demolition of former remediation systems components.

8.3 RECOMMENDED ACTIONS

Task One – Site Review and Work Plan Development

This task provides for the review of NMED/USTB files, site mapping and photography, review of historic ground water and soils data, and final preparation of this work plan for additional investigation.

Task Two – Sample Existing Wells and Conduct Three Additional Quarterly Sampling Rounds

Ground water in all usable wells (fifteen existing wells) will be sampled during an initial event for organic parameters including BTEX, MTBE, EDC, EDB, and naphthalene using EPA Method 8260. The following natural attenuation indicators will also be sampled for using field test kits: dissolved oxygen (DO), nitrate (NO₃), dissolved and total iron (Fe), alkalinity (HCO₃/CO₃), phosphate (PO₄), and sulfate (SO₄). Additional field tests will include pH, temperature, and conductivity. FEI/TPA will provide NMED/USTB and BCEHD 48-hour notification prior to initiating any sampling.

We also propose three additional quarters of ground water sampling for BTEX, TMB, EDB, EDC and MTBE using EPA Method 8021 (EDX) and for the above natural attenuation indicators. We propose sampling 10 wells in the second quarter, 15 wells in the third quarter and 10 wells in the fourth quarter.

During each sampling event, ground water levels will be measured prior to sampling. Collected data will be used to refine drilling locations as needed in Task Three below. New locks and well caps will be installed on each usable well. Quarterly reports will be submitted according to the requirements of USTR §1216.

Task Three - Hydrogeologic Investigation

General – FEI/TPA will characterize the magnitude and extent of soil and ground water contamination in the Site vicinity through advancement and sampling of soil borings and monitor wells. Tentative drilling locations are shown in Figure 8B. Off-site access will be required for several drilling locations. For the purposes of cost estimation and based on a comprehensive review of the Site data we propose the following number of soil borings and wells:

Projected Drilling Activity

- 13 - Soil borings
- 12 - 2" diameter shallow completion monitoring wells

- 3 - 4" diameter Multi-Use Monitor/VE wells w/high flow screen (*see below*)
- 1 - 2" diameter deep completion monitor/AS well
- 5 - 1" diameter multiple completion pilot test wells (*see below*)

All soil borings will be sampled on a continuous basis using either 2-foot long split spoons or 5 foot long core barrels. PID headspace analysis will be conducted on retrieved soil samples at five-foot intervals or less and at the water table. One to two laboratory soil samples will be collected from each drilling location and analyzed for TPH (gasoline range) using EPA method 8015 modified and for BTEX and MTBE using EPA Method 8021. Samples will be collected for gasoline-range compounds using methanol extraction kits and unpreserved 4-oz jars for diesel-range compounds. New ground water monitoring wells installed during this task will be sampled and analyzed for the same EPA 8260 hydrocarbon parameters, natural attenuation indicators and field tests which were described for the initial well sampling in Task 2. Additionally, all new and existing wells will be surveyed to a common USGS (or other) established Mean Sea Level benchmark datum by a NM licensed surveyor.

We recommend conducting an AS/VE pilot test to evaluate potential remedial alternatives. To minimize mobilization costs and maximize soil and ground water data collection we propose that several of the proposed drilling locations be completed as multi-use 4" diameter wells or 1" diameter pilot test vacuum well clusters.

Aquifer Hydraulic Properties - Pursuant to the requirements of the USTR Part XII, Section 1210, FEI/TPA recommend evaluation of Site hydrogeologic properties through laboratory testing of retrieved sediment samples. Data collected from these activities will be used to determine grain size distribution, grain and bulk density, specific permeability (k) and effective porosity (n). Hydraulic properties such as storativity, transmissivity (T), and hydraulic conductivity (K) can then be estimated using sediment sample data. This information will then be used to calculate average ground water and contaminant migration rates, which are necessary in risk assessment calculations and/or determination of potential remedial alternatives. We recommend two monitor well locations to collect discrete sediment samples for laboratory characterization. Two samples will be collected from each location; one in the vadose zone, and one in the shallow saturated zone. In addition to the above, two of the samples will also be analyzed for total organic carbon content (TOC).

Task Four - Completion of the Hydrogeologic Investigation (HI) Report

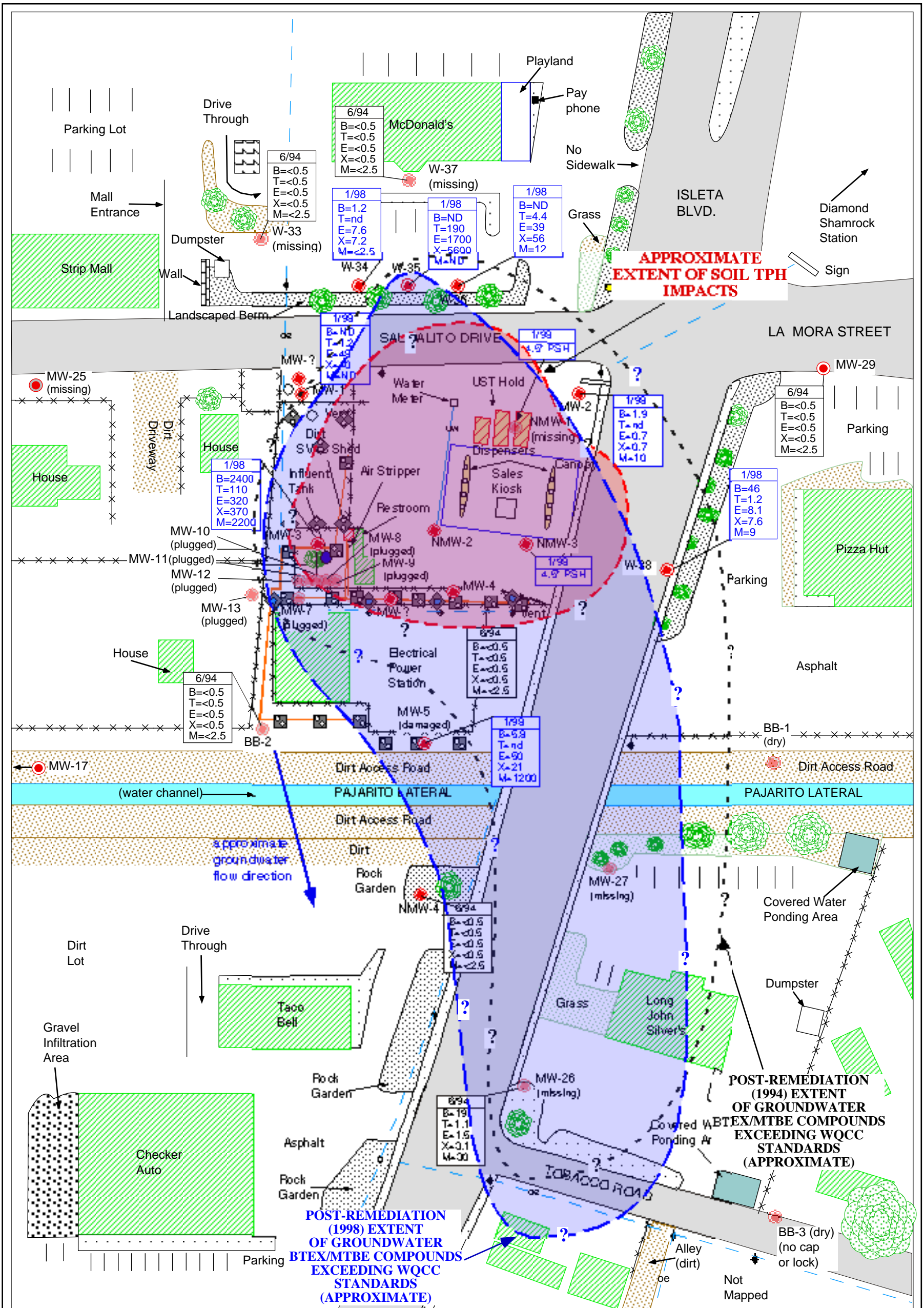
Upon receipt of all field data, FEI/TPA will prepare a summary HI report. This Report will include geologic and contaminant distribution cross sections, isoconcentration maps, a ground water isocontour map, appropriate tables, and text summarizing the results of the investigation as it relates to plume characterization and site remediation, and the requirements of the USTR. In addition, residual hydrocarbon spill mass estimates will be included.

Task Five - Conduct AS/VE Pilot Test (Optional)

As discussed above, FEI/TPA recommends the implementation of a short-term AS/VE pilot test to evaluate remedial alternatives, the effects of short-circuiting, well spacing/zone(s) of influence, process water generation vs. applied vacuum, flow and vacuum responses, and off-gas emission concentration and composition. Data collected during the pilot test will be used to aid in design of the final reclamation system.

Due to the many site complexities, the pilot test will be conducted in two primary phases over a one-day period. Phase One will consist of in-situ VE testing on several newly installed high performance 4" diameter wells (see above). In an effort to evaluate the effects of lithologic heterogeneity across the Site and short-circuiting from the previously installed reclamation systems, pilot testing will be conducted at three separate locations. Tentative test wells include VW-3 (primary test well) and VW-1 and VW-2 (ancillary test wells). Using proposed monitor wells in conjunction with strategically placed vadose/phreatic zone 1" diameter vacuum monitoring well clusters, will allow measurement of vacuum responses and sparging effectiveness in a three dimensional nature during each portion of the pilot test. It should be noted that the use of pre-existing wells to measure vacuum responses is likely to provide erroneous data as many of these wells were installed as drive-point wells and lack bentonite seals.

Phase Two will consist of combined in-situ AS/VE at well locations VW-3 and AS-1. Phase One will be run for approximately 4 hours; starting with wells VW-2 and VW-1 for approximately one hour each followed by two hours of applied VE at well VW-3. Phase Two will consist of continued operation of VW-3 and initiation of sparging into AS-1 for an approximate 8-hour period. During the Phase Two portion of the test, a tracer gas (helium or sulfur hexafluoride) will be injected into the sparging well at a known concentration. Samples will be collected from the VE well using a field detector to evaluate flow and travel time characteristics at the Site. Six vapor samples will be collected in tedlar bags and sent to the laboratory for TPH and BTEX analysis using EPA method 8015 modified and 8021. In addition, three samples will also be analyzed for fixed gases and methane using standard EPA methodology.



Soil and Groundwater Quality Summary Map

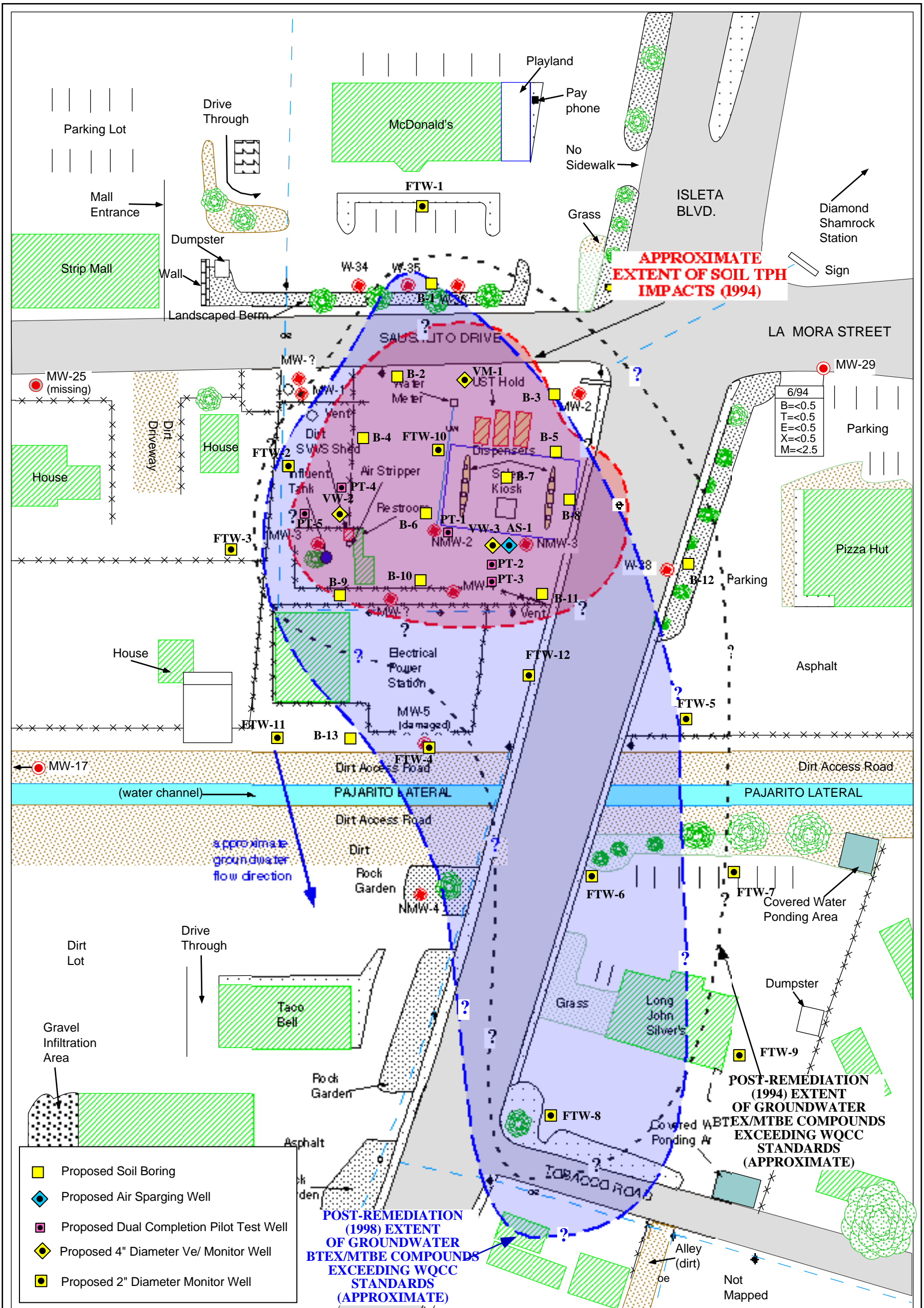
Former Atex #213 Site
3501 Isleta Blvd. SW, Albuquerque, N.M.

FEI FAITH ENGINEERING, INC.



TECUMSEH
PROFESSIONAL ASSOCIATES, INC.

Drawn by:	WJB/CAF	7/99	Client:	BCHED
Drafted by:	ABL	7/99	Job #	035-001
Approved by:	WJB	7/99	Figure:	8A



Proposed Drilling and Pilot Test Locations

Former Atex #213 Site
3501 Isleta Blvd. SW, Albuquerque, N.M.

FEI FAITH ENGINEERING, INC.

TECUMSEH
PROFESSIONAL ASSOCIATES, INC.

Drawn by: WJB/CAF 7/99 Client: BCHED

Drafted by: ABL 7/99 Job # 035-001

Approved by: WJB 7/99 Figure: 8B

12/1/95•BJWR 0		NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — SUMMARY SHEET	
Site Name: Atex #213		Site Address: 3501 Isleta SW Albuquerque, NM 87105	
Circle only one: <div style="border: 1px solid black; display: inline-block; padding: 2px;">Work plan</div> Claim	Circle only one: Minimum Site Assessment <div style="border: 1px solid black; display: inline-block; padding: 2px;">Phase 1 — Hydrogeo Investigation</div>	Phase 2 — Free Product / Saturated Soil Recovery Phase 3 — Reclamation Proposal	Phase 4 — Reclamation Implementation <div style="border: 1px solid black; display: inline-block; padding: 2px;">Phase 5 — Operations and Maintenance</div>
FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5		NMED Use Only	
SUMMARY SHEET		TOTAL	
PROFESSIONAL SERVICES		\$38,380.00	
TAXABLE EXPENSES		\$6,348.00	
TAXABLE SUBCONTRACTORS		\$30,583.35	
TAXABLE SUBTOTAL		\$75,311.35	
NMGR T RATE 5.5625% X TAXABLE SUBTOTAL =		\$4,189.19	
TOTAL		\$79,500.54	
NONTAXABLE EXPENSES			
NONTAXABLE SUBCONTRACTORS			
NONTAXABLE SUBTOTAL			
GRAND TOTAL OF CLAIM			

12/1/95•BJWR

NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — PROFESSIONAL SERVICES

Site Name: Atex #213**Site Address:** 3501 Isleta SW
Albuquerque, NM 87105**Circle only one:**☒ **Work plan** ☐ **Claim****Circle only one:**☐ Minimum Site Assessment☒ Phase 1 — Hydrogeo Investigation☐ Phase 2 — Free Product /
Saturated Soil Recovery☐ Phase 3 — Reclamation Proposal☐ Phase 4 — Reclamation Implementation☐ Phase 5 — Operations and Maintenance

FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5

NMED Use Only

PROFESSIONAL SERVICES	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
Initial Sampling +3 qtrs gw monitoring					\$12,920.00		
Drilling & Sampling (Hydrogeologic Investigation)					\$10,260.00		
Hydrogeologic Report					\$10,080.00		
Pilot Testing					\$5,120.00		
SUBTOTAL					\$38,380.00		

NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — EXPENSES

Site Name: Atex #213

Site Address: 3501 Isleta SW
Albuquerque, NM 87105

Circle only one:

☒ Work plan ☐ Claim

Circle only one:

Minimum Site Assessment

☒ Phase 1 — Hydrogeo InvestigationPhase 2 — Free Product /
Saturated Soil Recovery

Phase 3 — Reclamation Proposal

Phase 4 — Reclamation Implementation

☐ Phase 5 — Operations and Maintenance

FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5

NMED Use Only

EXPENSES	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
NONTAXABLE							
N/A							
NONTAXABLE SUBTOTAL							
TAXABLE							
Initial Sampling +3 qtrs gw monitoring					\$2,147.00		
Drilling & Sampling (Hydrogeologic Investigation)					\$2,772.00		
Hydrogeologic Report					\$467.00		
Pilot Testing					\$962.00		
TAXABLE SUBTOTAL					\$6,348.00		

9.0 G&S COMMUNITY CORNER SITE – 6100 ISLETA BLVD. SW NMED Facility Number 6647001

9.1 INTRODUCTION/SITE HISTORY

The Former G&S Community Corner Site (the Site) is located at 6100 Isleta Boulevard SW. Hydrocarbon releases were first discovered in the Site vicinity in October 1988, when elevated hydrocarbon vapor levels were reported in the adjacent US West underground utility corridor. Subsequent installation and sampling of monitor wells identified gasoline hydrocarbon impacts to soils and ground water in the Site vicinity. The site is the current location of Kollar Kar Kare



Former G&S Facility Looking West

operated by Mr. Robert Kollar as an automotive repair facility. The facility is no longer used to dispense fuels.

Based on a comprehensive review of available historical data, past Site knowledge, and completion of a detailed site inspection, FEI/TPA presents the following site summary. In addition, detailed maps were constructed summarizing known Site conditions (Figures 9A, 9B and 9C).

- The Site has been the location of a series of gasoline service stations from the 1950's through 1989 when any remaining USTs were removed from the Site. Reportedly, two sets of USTs were located at the Site (Figure 9A). The more recently operated tanks were located in the southwestern portion of the Site. Based on available site data (presented below) these tanks did not experience major hydrocarbon releases. They were removed from the ground in 1989. The older tank location was located in the northern portion of the Site and appears to have experienced significant hydrocarbon releases (discussed below). These tanks were reportedly removed from the ground in 1984.
- In 1989 and 1990, Mariah and Associates, Inc. (Mariah) and Carson Geologic Services, Inc. (Carson) were retained by the responsible party to install three wells at the Site (MW-1, MW-2, and MW-3). Data collected during their investigations revealed the presence of soil and ground water BTEX contamination centered in the northern portion of the Site.

- During the Carson investigation, 15 private water supply wells were identified within 500 feet of the Site. The majority of these wells are apparently shallow and less than 100 feet deep. Reportedly, several abandoned water supply wells are also located in the same area. An on-site water supply well is located on the property (Figure 9A).
- In early 1992, the NMED placed the G&S Site on its list of state-lead GWPA sites. Ground water Technology, Inc. (GTI) was retained by NMED to complete investigation activities and design and install a remediation system. Between 1992 and 1994, GTI installed and sampled additional monitor wells and soil borings in the Site vicinity. These drilling locations are presented on Figure 9A. During GTI's early investigation activities, TPH laboratory samples were not collected from boreholes advanced at the Site. TPH data from subsequent investigations identified TPH levels at concentrations as high as 31,000 ppm in the vicinity of MW-9.
- Field inspection of the G&S Site by FEI/TPA identified measurement errors on the GTI basemap. These errors have been corrected on Figures 9A and 9C. FEI/TPA also identified at least 6 monitor and/or remediation wells, which were not identified on any of the maps we reviewed in the NMED case file. Three of these wells (located east of the Site building) appear to be part of the GTI remediation injection well gallery. Three other wells labeled as MW-A through MW-C on Figure 9A and 9C appear to be located along the piping runs for the remediation system and may be unreported remediation wells.
- Using the GTI borehole data, FEI/TPA constructed the two cross sections shown in Figure 9B. Analyses of these data provide useful insight into contaminant fate and transport mechanisms at the Site. Four primary lithologic units appear to be present in the upper 20 feet of sediments at the Site. Lithologic Unit I extends from the land surface to approximately 3 to 7 feet below ground surface (bgs) and is composed of silty sand with localized fill units near the land surface. Lithologic Unit II is composed of fine-grained sands, which extend from the base of Lithologic Unit I to depths of up to 11 feet bgs. Lithologic Unit III is reportedly composed of low permeability clay-rich sediments. This Unit was encountered in all wells and borings advanced at the Site and appears to be approximately 5 to 7 feet in thickness based on data obtained during drilling of MW-9 (deep). Lithologic Unit III has apparently acted as a barrier to vertical contaminant migration at the Site. Lithologic Unit IV underlies Lithologic Unit III at the location of MW-9 (deep) and is composed of well-sorted sand.
- Depth to static ground water at the Site has been measured to be approximately 7 to 8 feet bgs. Calculated shallow ground water flow is to the west-southwest at a gradient of approximately 0.002 to 0.001 feet/foot.
- The most important hydrogeologic feature identified at the Site appears to be the contact between Lithologic Units III and IV and its relationship with the static water table. This lithologic contact appears to undulate across the site, varying in depth by as much as 4 feet. Primary contaminant migration appears to be along the above referenced contact through Lithologic Unit II. Examination

of cross section A-A' and B-B' suggests the presence of a "bowl-shaped" area of coarse-grained Lithologic Unit II sediments that extend several feet below the water table in the immediate vicinity of the former northern tank pit. The majority of contamination in the Site vicinity appears to have been concentrated in this zone prior to remedial efforts. The presence of low permeability clay-rich Lithologic Unit III sediments extending "above" the water table in select areas may have acted as a partial barrier to horizontal contamination migration at the Site.

- The approximate extent of soil hydrocarbon contamination prior to remedial efforts is shown in Figures 9B and 9C. TPH soil contamination was concentrated in the general vicinity of the northwestern portion of the Site. Analysis of laboratory chromatograms suggests gasoline contaminants at the Site were weathered in nature. A larger vapor-phase hydrocarbon halo surrounded the TPH contamination core. Phase Separated Hydrocarbon (PSH) has been measured at varying amounts in wells MW-2, MW-3, and MW-4 since initial discovery of the releases. A moderate-sized dissolved-phase ground water BTEX plume was documented at the Site prior to remedial efforts.
- In April 1994, GTI conducted a multi-phase vacuum extraction (MPVE) pilot test at the Site using well ASVP (Figure 9C). Based on their test, GTI calculated an effective radius of influence of approximately 38 feet. Our analysis of pilot test data suggest a smaller effective zone of vacuum influence (EZVI) of approximately 20 to 25 feet. Substantial pressure drops documented between applied vacuum measured at the blower and applied vacuum measured at the ASVP well head (~50%) suggest some type of problem with the piping or the well construction during the pilot test. Maximum flow was approximately 40 standard cubic feet per minute (scfm) and maximum applied vacuum measured at the wellhead was 4.5" Hg. Recovered vapor samples sent for laboratory analysis contained between 2,100 and 2,600 ppm/v TPH.
- An in-situ MPVE reclamation system was installed at the Site in 1995 consisting of six 2" diameter schedule 40 PVC wells manifolded via underground 3" diameter schedule 40 PVC piping to a liquid-ring vacuum pump, liquid-phase GAC treatment canisters, an oil-water separator, and a 250 scfm catalytic oxidizer. Treated vapors were discharged to the atmosphere and treated ground water was re-injected to ground water via an infiltration gallery located to the southeast of the on-site building. The system operated between August 1995 and April 1996. High levels of hydrocarbon vapors recovered during initial system operation resulted in catalyst thermal failure. Subsequent modification of the remediation system and well operating configurations prevented this occurrence during the remaining operational period.



PSH in MW-4 During July 1999

- Hydrocarbon recovery from the Site during the period of operation is not well documented and is based predominantly on PID readings. During the final quarter of system operation, GTI calculated the system physically removed only 28 pounds of hydrocarbons.
- During our recent site inspection, approximately 1/8" of PSH was identified (see previous photograph) in downgradient monitor well MW-4 (Figure 9C). The most recent ground water sampling of select monitor wells at the Site documented significant reductions in BTEX concentrations in monitor wells MW-3, ASVP, and MW-10. However, this may be the result of having sampled former remediation wells as opposed to strictly monitoring wells. During the November, 1997 sampling event, PSH was documented in monitor wells MW-2 and MW-4. Current dissolved-phase ground water quality at the Site is unknown.
- The current condition of the subgrade treatment system and reinjection gallery is unknown. The oxidizer was not observed at the Site during our Site inspection in July of 1999. The catalytic oxidizer has been removed from the Site along with all aboveground controls. The liquid-ring vacuum pump was sitting in the backlot of the property (see photograph) and appeared to need maintenance and repair. The electrical service at the Site needs to be modified to meet current building code standards.



installed in the vicinity of the release at locations between remediation wells to provide more accurate ground water quality data for the Site. These borings should be continuously sampled for lithology and analyzed for soil TPH and BTEX as well.

9.2 EXISTING SITE CONDITIONS

Based on the above data, the following deficiencies need to be addressed:

- At present, only one monitor well appears present on-site, which has not been manifolded into the remediation system. Monitor wells need to be installed in the vicinity of the release at locations between remediation wells to provide more accurate ground water quality data for the Site. These borings should be continuously sampled for lithology and analyzed for soil TPH and BTEX as well.
- The presence of persistent PSH in monitor wells MW-2 and MW-4 needs to be more fully evaluated. The western extent of ground water hydrocarbon impacts has not been characterized and is of critical concern to nearby downgradient water supply wells. Understanding the subsurface topography of the Lithologic Unit II/III contact is critical in evaluating potential for further off-site migration of hydrocarbons and potential threats to nearby off-site private water supply wells.

- The initial pilot test at the Site did not fully characterize subsurface conditions and treatment well efficiency. No monitoring points were located within 25 feet of the pilot test well. Furthermore, initial vapor concentrations were underestimated.
- The existing remedial system should be tested to evaluate radii of influence, off-gas concentrations, and operational status. Screened intervals in each of the treatment/monitor wells should also be evaluated as well screens do not fully penetrate the vadose zone impacted soil column and extend up to five feet below the base of the hydrocarbon impacted soil column (Figure 9B). It is likely that screening of these wells higher in the soil column would have resulted in greater well efficiency. Upgrade and operation of the existing reclamation system will likely be required to mitigate PSH and source area hydrocarbons.

9.3 RECOMMENDED ACTIONS

Task One – Site Review and Work Plan Development

This task provides for the review of NMED/USTB files, site mapping and photography, review of historic ground water and soils data, and final preparation of this work plan for additional investigation.

Task Two – Sample Existing Wells and Conduct an Additional Three Quarterly Sampling Rounds

Ground water in all usable wells (eighteen existing wells) will be sampled during an initial event for organic parameters including BTEX, MTBE, EDC, EDB, and naphthalene using EPA Method 8260. The following natural attenuation indicators will also be sampled for using field test kits: dissolved oxygen (DO), nitrate (NO₃), dissolved and total iron (Fe), alkalinity (HCO₃/CO₃), phosphate (PO₄), and sulfate (SO₄). Additional field tests will include pH, temperature, and conductivity. FEI/TPA will provide NMED/USTB and BCEHD 48-hour notification prior to initiating any sampling.

We also propose three additional quarters of ground water sampling for BTEX, TMB, EDB, EDC and MTBE using EPA Method 8021 (EDX) and for the above natural attenuation indicators. We propose sampling 10 wells in the second, third and fourth quarters.

During each sampling event, ground water levels will be measured prior to sampling. Collected data will be used to define drilling locations as needed in Task Three below. New locks and well caps will be installed on each usable well. Quarterly reports will be submitted according to the requirements of USTR §1216.

Task Three - Hydrogeologic Investigation

General – FEI/TPA will characterize the magnitude and extent of soil and ground water contamination in the Site vicinity through advancement and sampling of soil borings and monitor wells. Tentative drilling locations are shown in Figure 9C. Off-site access will be required for several drilling locations. For the

purposes of cost estimation and based on a comprehensive review of the Site data we propose the following number of soil borings and wells:

Projected Drilling Activity

- 5 - Soil borings
- 4 - 2" diameter shallow completion monitor wells
- 5 - 4" diameter Multi-Use Monitor/VE wells w/high flow screen (*see below*)
- 3 - 1" diameter multiple completion pilot test wells (*see below*)

All soil borings will be sampled on a continuous basis using either 2-foot long split spoons or 5 foot long core barrels. PID headspace analysis will be conducted on retrieved soil samples at five-foot intervals or less and at the water table. Two laboratory soil samples will be collected from each drilling location and analyzed for TPH (gasoline-range) using EPA method 8015 modified and for BTEX and MTBE using EPA method 8021. Samples will be collected for gasoline-range compounds using methanol extraction kits. New ground water monitoring wells installed during this task will be sampled and analyzed for the same EPA 8260 hydrocarbon parameters, natural attenuation indicators and field tests which were described for the initial well sampling in Task 2. Additionally, all new and existing wells will be surveyed to a common USGS (or other) established Mean Sea Level benchmark datum by a NM licensed surveyor.

We recommend conducting a VE pilot test to evaluate the current condition of the existing remedial system and the potential for expansion and upgrade. To minimize mobilization costs and maximize soil and ground water data collection, we propose that several of the proposed drilling locations be completed as multi-use 4" diameter wells or 1" diameter pilot test well clusters. Pilot testing will be conducted on the existing MPVE remedial system and at one of the newly installed high performance 4" diameter pilot test wells. Based on our current understanding of the Site, air sparging would have only limited applications.

Aquifer Hydraulic Properties - Pursuant to the requirements of the USTR Part XII, Section 1210, FEI/TPA recommend evaluation of Site hydrogeologic properties through laboratory testing of retrieved sediment samples. Data collected from these activities will be used to determine grain size distribution, grain and bulk density, specific permeability (k) and effective porosity (n). Hydraulic properties such as storativity, transmissivity (T), and hydraulic conductivity (K) can then be estimated using sediment sample data. This information will then be used to calculate average ground water and contaminant migration rates, which are necessary in risk assessment calculations and/or determination of potential remedial alternatives. We recommend two monitor well locations to collect discrete sediment samples for laboratory characterization. Two samples will be collected from each location; one in the vadose zone, one in the shallow saturated zone. In addition to the above, two of the samples will also be analyzed for total organic carbon content (TOC).

We also recommend biological characterization of select retrieved soil samples for plate count analysis of total microbial populations and total hydrocarbon degrading populations in a laboratory setting. One sample will be collected from the vadose zone and one from the phreatic zone. These data will provide useful information regarding the potential for enhanced biodegradation of hydrocarbons at the Site.

Task Four - Completion of the Hydrogeologic Investigation (HI) Report

Upon receipt of all field data, FEI/TPA will prepare a summary HI report. This Report will include geologic and contaminant distribution cross sections, isoconcentration maps, a ground water isocontour map, appropriate tables, and text summarizing the results of the investigation as they relate to plume characterization and site remediation, and the requirements of the USTR. In addition, residual hydrocarbon spill mass estimates will be included.

Task Five - Conduct VE Pilot Test and Evaluate Portions of the Remediation System. (Optional)

We recommend evaluation of the current condition of the MPVE system, which has been abandoned in place for over three years. The condition of subgrade piping and the condition of treatment wells should be evaluated. We also recommend evaluation of the efficiency of current 2" diameter wells compared with proposed high performance 4" diameter wells. In conjunction with engineering evaluation of the system we also recommend the implementation of a short-term MPVE pilot test to better evaluate remedial alternatives, well spacing/zone(s) of influence, process water generation vs. applied vacuum, flow and vacuum responses, and off-gas emission concentration and composition. Data collected during the pilot test will be used to aid in determining the best remedial approach for the Site, which will likely involve upgrade and expansion of the existing remedial system.

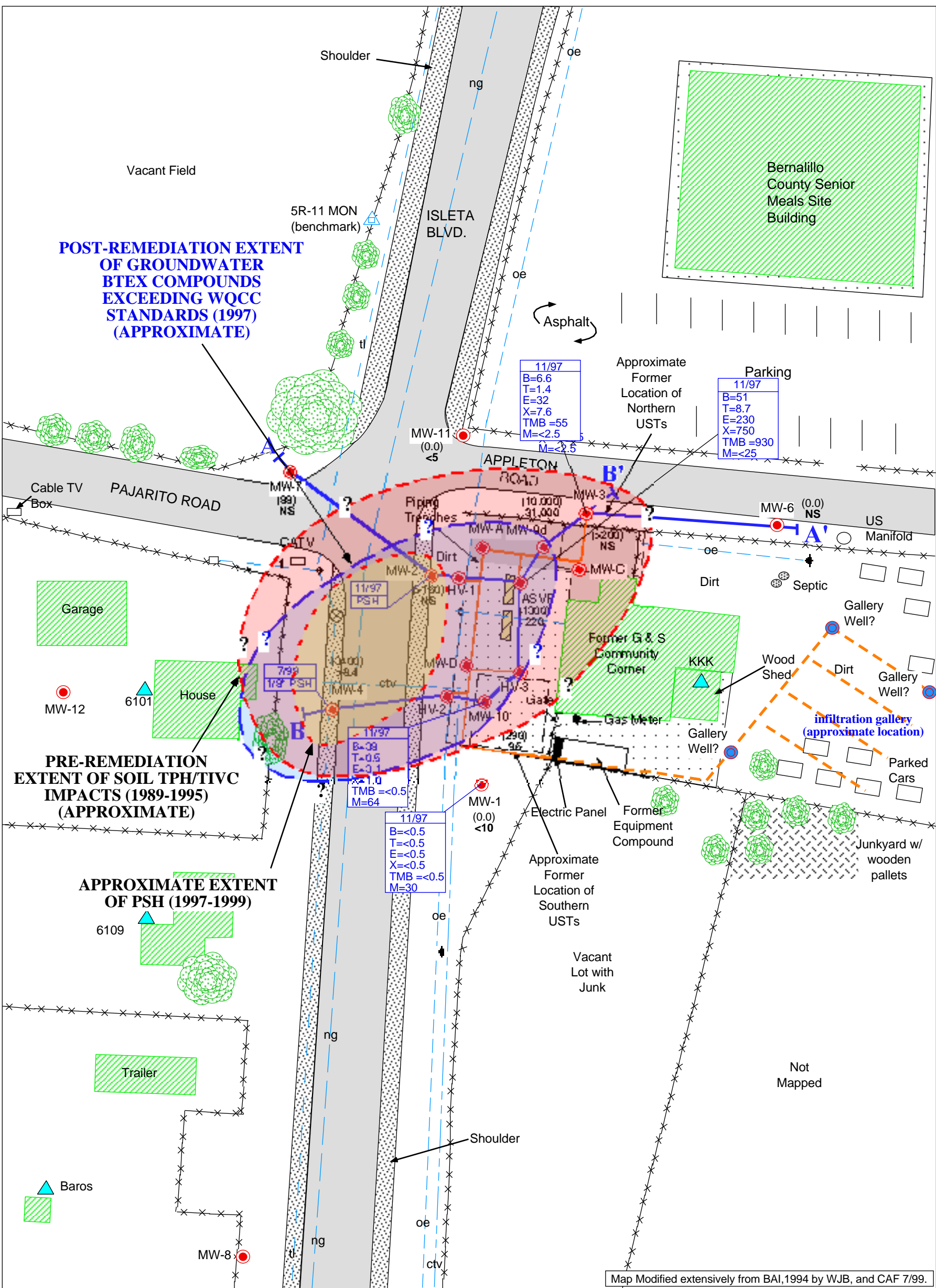
Due to the many site complexities, the pilot test will be conducted in two primary phases over a two-day period. Phase One will consist of in-situ VE testing on previously installed 2" diameter wells. A blower will be connected to the primary manifold in the former equipment compound. Each of the six existing treatment wells will be tested for an approximate one-hour period to evaluate potential piping breaks, leaks, etc. and off-gas emission concentrations. Following this phase of testing, well HV-1 will be operated for a period of approximately 4 hours. Initially, vacuum and flow will be increased in step fashion to evaluate optimal conditions and determine the breakthrough point for two-phase flow from the well. Once optimal flow conditions have been evaluated, applied vacuum and flow will be maintained for the duration of the test. Using newly installed monitor wells and combination vadose/phreatic zone 1" diameter vacuum monitoring well clusters, will allow measurement of vacuum responses on a three dimensional basis during each portion of the pilot test. A PID and an explosimeter/oxygen meter will be used to field screen vapor emissions from the wells. Four vapor samples will also be collected in tedlar bags during the first day and sent to the laboratory for TPH and BTEX analysis using EPA method 8015 modified and 8021. In addition, two samples will also be analyzed for fixed gases and methane using standard EPA methodology.

Phase Two will consist of in-situ VE testing in newly installed high performance 4" diameter wells, VM-

2 and VM-3 (see above). In an effort to evaluate the effects of lithologic heterogeneity across the Site and potential EZVI beneath Isleta Boulevard, day two pilot testing will be conducted at two separate locations. Phase Two testing will also evaluate the effectiveness of larger diameter, more efficient treatment wells at the Site and focus on off-site VE effectiveness in the vicinity of monitor well, MW-4 (contains PSH). Initially, vacuum and flow will be applied in VM-2 (Figure 9C). As presented above, vacuum and flow will be applied in a step-wise fashion to identify the most efficient operating configuration vs. water generation. VE testing will be conducted on VM-2 for an approximate 4-hour period. This test will allow direct comparison of the high performance 4" diameter wells with earlier installed 2" diameter wells.

The second half of day two testing will involve VE testing of off-site well VM-3 in the vicinity of monitor well MW-4. This well will be tested in the same manner as VM-2.

A PID and an explosimeter/oxygen meter will be used to field screen vapor emissions from the wells. Four vapor samples will also be collected in tedlar bags during day two and sent to the laboratory for TPH and BTEX analysis using EPA method 8015 modified and 8021. Using proposed monitor wells in conjunction with strategically placed vadose/phreatic zone 1" diameter monitoring well clusters will allow measurement of vacuum in a three dimensional nature during each portion of the pilot test.



Map Modified extensively from BAI, 1994 by WJB, and CAF 7/99.

Explanation:

- Present Monitor Well Location (711) ← PID Reading (in ppm/v)
6600 ← TPH as gasoline
- ▨ Building
- ▨ Asphalt
- ▨ Concrete
- ×× Fence
- ⊗ Vegetation
- ▲ Private Water Supply Well

- oe Overhead Electric
- tl Telephone Line
- ng Natural Gas
- ctv Cable T.V. Line
- B-B' Location of Cross Section

Sampling Date

B=Benzene
T=Toluene
E=Ethyl Benzene
X=Total Xylenes
TMB=Tri-methyl Benzene
M=(MTBE) Methyl-Tertiary Butyl Ether
All concentrations in Parts Per Billion (ppb)

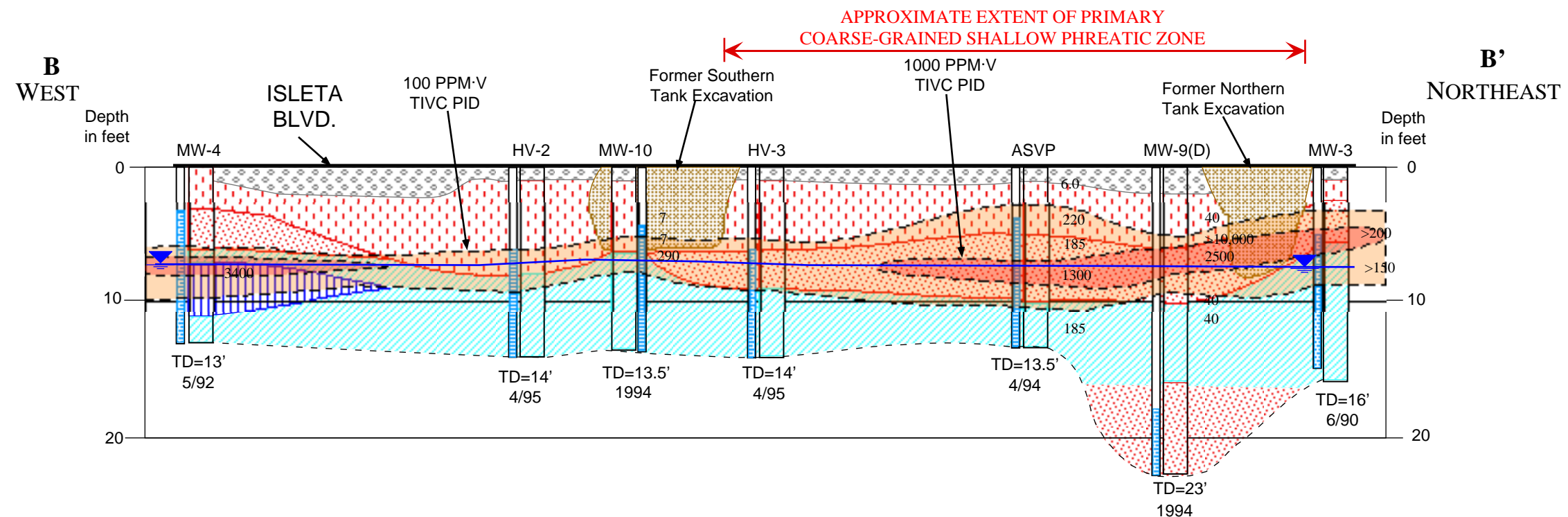
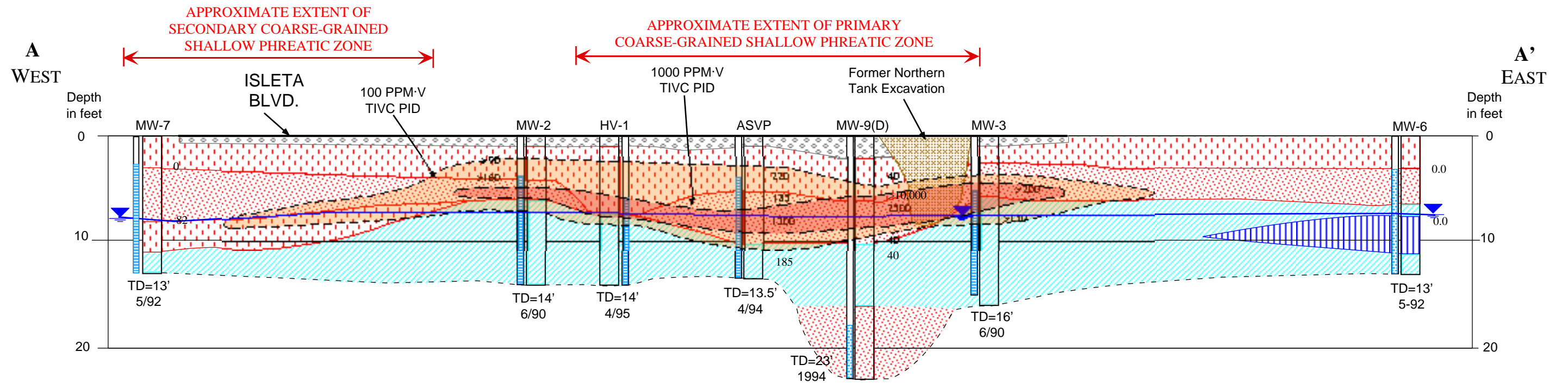
0 20 40ft

Scale 1"=40'

Soil and Groundwater Quality Summary Map

Former G & S Community Corner Site
6100 Isleta Blvd. SW
Albuquerque, New Mexico

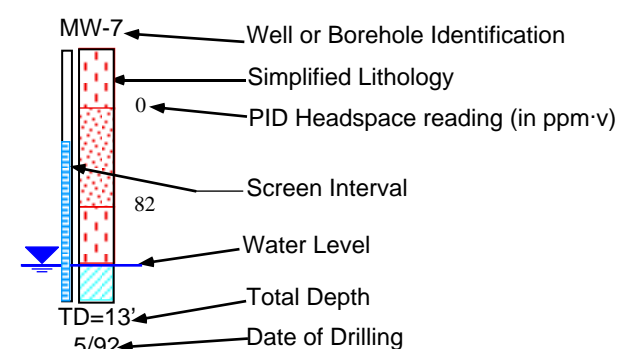
FEI FAITH ENGINEERING, INC.		TECUMSEH PROFESSIONAL ASSOCIATES, INC.	
Drawn by:	WJB/CAF	7/99	Client: BCEHD
Drafted by:	ABL	7/99	Job # 035-001
Approved by:	WJB	8/99	Figure: 9A



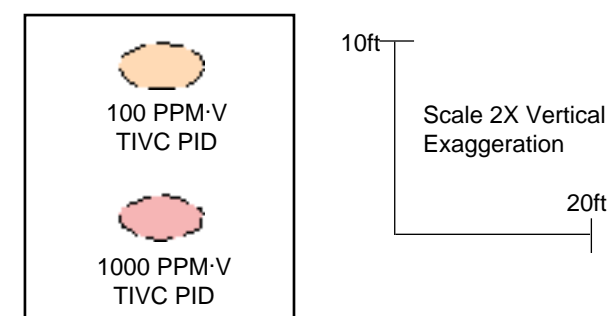
EXPLANATION:

Lithology			
SM	Well sorted sands	ML	Silt, clayey or sandy (low clay content)
SP	Well sorted sands	CL	Clay (high clay content)
	Fill Material/Asphalt		
	Excavation Fill		

ORIGINAL BOREHOLE DATA FROM GTI, 1992-1996 AND CGS, 1990)



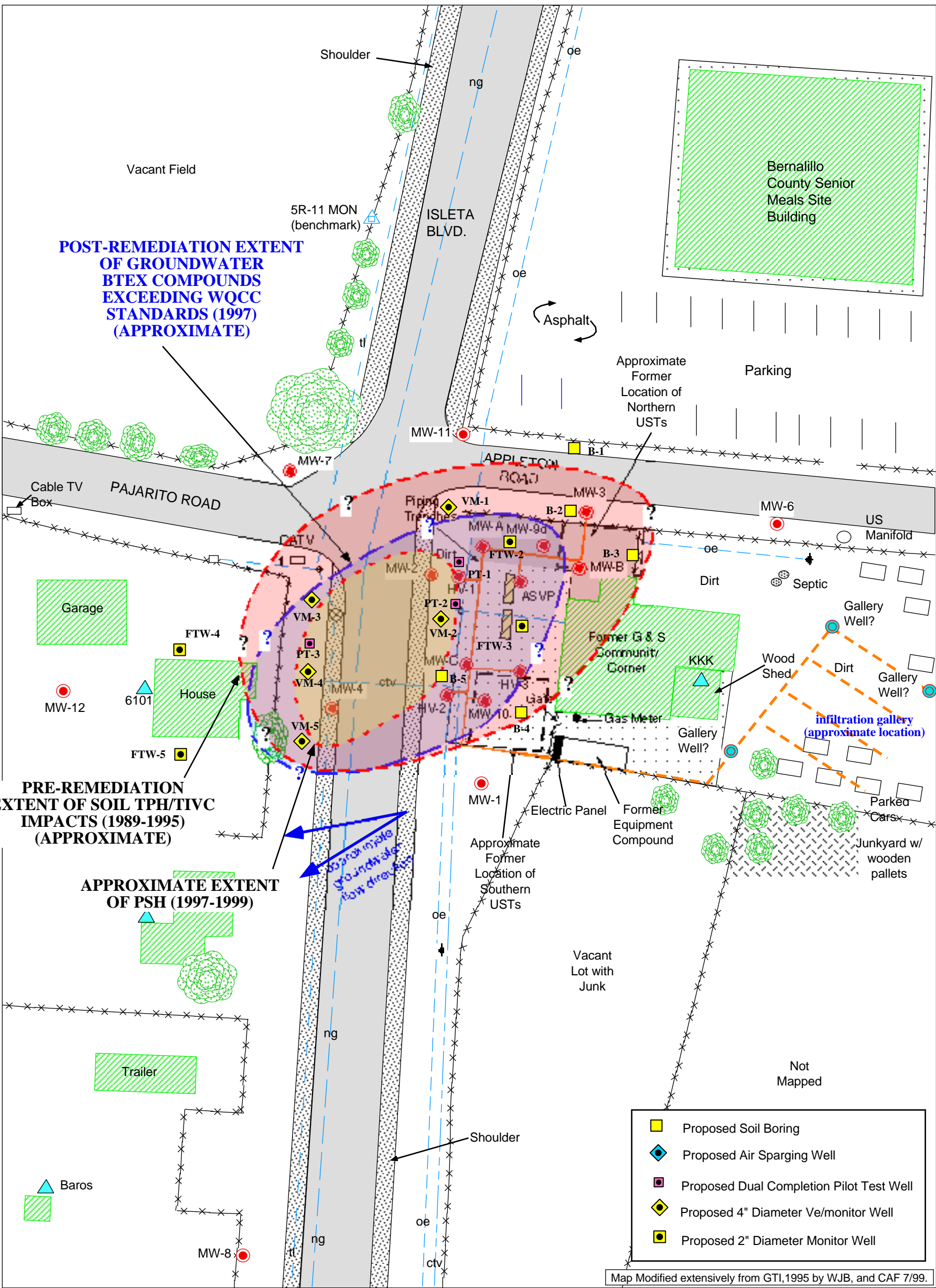
This Cross Section is an interpretation of available data. Some variations may be expected from actual site conditions.



Simplified Geologic and Contaminant Cross Section

A-A' and B-B'
G & S Community Corner

FEI FAITH ENGINEERING, INC.			
TECUMSEH PROFESSIONAL ASSOCIATES, INC.			
Drawn by:	WJB	8/99	Client: BCEHD
Drafted by:	ABL	8/99	Job # 035-001
Approved by:	WJB	8/99	Figure: 9B



Map Modified extensively from GTI, 1995 by WJB, and CAF 7/99.

Explanation:

- Present Monitor Well Location (711)
 - PID Reading (in ppm/v)
 - TPH as gasoline
 - Building
 - Asphalt
 - Concrete
 - Fence
 - Vegetation
 - Private Water Supply Well
 - Power Pole
 - Overhead Electric
 - Telephone Line
 - Natural Gas
 - Cable T.V. Line
 - Location of Cross Section
- Sampling Date
- B=Benzene
T=Toluene
E=Ethyl Benzene
X=Total Xylenes
TMB=Tri-methyl Benzene
M=(MTBE) Methyl-Tertiary Butyl Ether
All concentrations in Parts Per Billion (ppb)
- 0 20 40ft
Scale 1"=40'

Proposed Drilling and Pilot Test Locations

Former G & S Community Corner Site
6100 Isleta Blvd. SW
Albuquerque, New Mexico

FEI FAITH ENGINEERING, INC.

TECUMSEH
PROFESSIONAL ASSOCIATES, INC.

Drawn by:	WJB/CAF	7/99	Client: BCEHD
Drafted by:	ABL	7/99	Job # 035-001
Approved by:	WJB	8/99	Figure: 9C

12/1/95•BJWR	0	NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — SUMMARY SHEET	
Site Name: G&S Community		Site Address: 6100 Isleta SW Albuquerque, NM 87105	
Circle only one: <div style="border: 1px solid black; padding: 2px; display: inline-block;">Work plan</div> Claim	Circle only one: Minimum Site Assessment <div style="border: 1px solid black; padding: 2px; display: inline-block;">Phase 1 — Hydrogeo Investigation</div>	Phase 2 — Free Product / Saturated Soil Recovery Phase 3 — Reclamation Proposal	Phase 4 — Reclamation Implementation <div style="border: 1px solid black; padding: 2px; display: inline-block;">Phase 5 — Operations and Maintenance</div>
FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5		NMED Use Only	
SUMMARY SHEET	TOTAL	Project Manager	Auditor
PROFESSIONAL SERVICES	\$33,600.00		
TAXABLE EXPENSES	\$5,877.75		
TAXABLE SUBCONTRACTORS	\$19,460.70		
TAXABLE SUBTOTAL	\$58,938.45		
NMGRT RATE 5.5625% X TAXABLE SUBTOTAL =	\$3,278.45		
TOTAL	\$62,216.90		
NONTAXABLE EXPENSES			
NONTAXABLE SUBCONTRACTORS			
NONTAXABLE SUBTOTAL			
GRAND TOTAL OF CLAIM	\$62,216.90		

12/1/95•BJWR

NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — PROFESSIONAL SERVICES

Site Name: G&S Community**Site Address:** 6100 Isleta SW
Albuquerque, NM 87105**Circle only one:**☒ **Work plan** ☐ **Claim****Circle only one:**☐ Minimum Site Assessment☒ Phase 1 — Hydrogeo Investigation☐ Phase 2 — Free Product /
Saturated Soil Recovery☐ Phase 3 — Reclamation Proposal☐ Phase 4 — Reclamation Implementation☐ Phase 5 — Operations and Maintenance

FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5

NMED Use Only

PROFESSIONAL SERVICES	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
Initial sampling + 8 qtrs gw monitoring					\$12,200.00		
Drilling & Sampling (Hydrogeologic Investigation)					\$7,860.00		
Hydrogeologic Report					\$8,420.00		
Pilot Testing					\$5,120.00		
SUBTOTAL					\$33,600.00		

NEW MEXICO CORRECTIVE ACTION FUND COST DETAIL FORM — EXPENSES

Site Name: G&S Community

Site Address: 6100 Isleta SW
Albuquerque, NM 87105

Circle only one:

☒ Work plan ☐ Claim

Circle only one:

Minimum Site Assessment

☒ Phase 1 — Hydrogeo InvestigationPhase 2 — Free Product /
Saturated Soil Recovery☐ Phase 3 — Reclamation Proposal

Phase 4 — Reclamation Implementation

☐ Phase 5 — Operations and Maintenance

FIXED-PRICE CONTRACT FOR ALL TASKS IN PHASE 1 AND 5

NMED Use Only

EXPENSES	Invoice #	Rate	Unit	# of Units	Total	Project Manager	Auditor
NONTAXABLE							
N/A							
NONTAXABLE SUBTOTAL							
TAXABLE							
Initial sampling + 8 qtrs gw monitoring					\$2,312.00		
Drilling & Sampling (Hydrogeologic Investigation					\$2,023.00		
Hydrogeologic Report					\$557.00		
Pilot Testing					\$985.75		
TAXABLE SUBTOTAL					\$5,877.75		

